

Shoumen Palit Austin Datta

Massachusetts Institute of Technology - <https://autoid.mit.edu/shoumen-datta>

MIT Auto-ID Laboratory - <https://dspace.mit.edu/handle/1721.1/117273>

MIT ILP (Industrial Liaison Program) - <https://ilp.mit.edu/node/23302>

Massachusetts General Hospital - <https://mdpnp.org/leadership.html>

Harvard Medical School - <http://mdpnp.mgh.harvard.edu>

CV - <https://dspace.mit.edu/handle/1721.1/146158>

Publications - <https://bit.ly/Google-Scholar-SD>

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List of Educational Institutions Attended

University of California, Berkeley
University of California San Francisco (UCSF)
Massachusetts Institute of Technology
Harvard Medical School
Massachusetts General Hospital
Rutgers University, NJ
Princeton University, NJ
University of Pittsburgh, PA
Université Pierre-et-Marie Curie (Paris VI)
Presidency College, India
University of Cambridge, UK



Full CV is available from the MIT Library <https://dspace.mit.edu/handle/1721.1/146158>

SHOUMEN DATTA - EXECUTIVE SUMMARY

EXPERIENCE, KNOWLEDGE, SKILLS, ABILITIES (EKSA)

Medicine, Healthcare, Public Health

Molecular Virology / Molecular Biology (PhD) – genetics of DNA and RNA viruses
Genomics - Human Genome Project (the first founding group)
Molecular Parasitology - Infectious Diseases
Chronic Diseases (Cancer)
Neuro-endocrine / endocrine cancers (thyroid, pituitary, glucocorticoid receptors)
Medical devices – data interoperability, data analytics, data distribution, data cybersecurity

Bio-Medical Research: Molecular Biology, Biochemistry, Genetics, Virology, Microbiology

Transcriptional regulation in HeLa cell extracts in vitro (DNA templates)
Reconstitution of protein complexes for initiation of mRNA synthesis
Yeast artificial chromosomes (YAC) for human genome sequencing
RNA polymerase III regulation of *Trypanosoma brucei* genes

Science, Decision Science, Data Science, Systems Engineering Concepts

Graphene Sensors for detection of SARS-CoV-2 (and other organisms, heavy metals, etc.)
Sensor data analytics for diverse applications, architecture of distributed decision support
Radio frequency identification (RFID) data and Internet of Things (IoT) applications
Software (process specifications, application design, systems mobility/connectivity)
Digital Transformation (Strategy and Analysis), Digital Supply Chain
Internet of Things (IoT), Industrial IoT, Industrie 4.0, Digital Twins, RFID
Principles of Data and Data Analytics (Machine Learning, ML; Artificial Intelligence, AI)

Strategy & Management

Strategy and Management of Operations
Supply Chain Management
Forecasting (Data Analytics)
Grants – US and EU federal funding agencies
Business and Product Portfolio Strategy - Technology and Innovation Management
Leading Customer Centric-Innovation for Global Leadership for Business Development
R&D Ecosystem Development using Strategic Public-Private-Government Partnerships

Excellence in Communications

Public Sector – STEM Education (Assistant to Mayor for major US city)
Public Sector – Technology and Economics Task Force (Chairman), US
Public Sector – Workforce Development, US Department of Commerce
Public Sector – Advisor to Governments (technology, operations, healthcare)
Private Sector – Consultant to Corporations (tech innovation, R&D, operations, sales, marketing)
Private Sector – Consultant for patent law related research (*ad hoc* litigation support team)

SHOUMEN DATTA - SUMMARY (PART 1 of 6 – ACADEMIC & PROFESSIONAL)

PROFESSIONAL PREPARATION / EDUCATION

University of California Berkeley	School of Engineering	Communications Networking, 1995 (audit; # CS168)
University of California San Francisco	School of Medicine	Infectious Disease and Molecular Parasitology
Massachusetts Institute of Technology	Whitehead Institute	Human Genome Project (Eric Lander Lab) & Transcription
Harvard Medical School	Molecular Medicine	Instructor / Lecturer, 1 st year Medical School (M.D. Curriculum)
Massachusetts General Hospital	Harvard Medical School	Fellow in Medicine (Research) Neuro/Endocrine/Oncology
UCSF School of Medicine, CA	School of Pharmacy	Pharm.D., 1998 (awarded, not earned)
Rutgers University, NJ	School of Medicine	Ph.D., 1989 (Molecular Biology, Virology, Microbiology)
Princeton University, NJ	Research Collaboration	Department of Molecular Biology (Lewis Thomas Labs)
University of Pittsburgh, PA	Molecular Biology	M.S., 1985 (Molecular Biology; MS equivalent)
Université Pierre-et-Marie Curie (Paris VI)	Visiting Student, Research	Institut du Cancer et d'Immunogénétique, Hôpital Paul Brousse
Presidency College, India	Physiology, Biochemistry	B.Sc., 1980 (Physiology, Biochemistry, Physics, Chemistry)
University of Cambridge	School Leaving	GCE/ISC, 1975 (Mathematics, Physics, Chemistry, Biology)

SELECT APPOINTMENTS / AFFILIATIONS

1999- <i>present</i>	Research Affiliate	MIT Auto-ID Center, MIT, Cambridge, MA
2014- <i>present</i>	Senior Scientist	MGH, Harvard Medical School, Cambridge, MA
2018-2024	Research Coordinator	USDA SmartPath Center of Excellence, University of Florida
2001-2010	Executive Director	MIT Forum for Supply Chain, MIT, Cambridge, MA
2001-2004	Strategy & Management	MIT Sloan School of Management
2013-2016	Senior Vice President	Industrial Internet Consortium (IIC)
2015-2020	Purdue University	Affiliated with NSF I/UCRC at Purdue for Robots & Sensors
2006-2021	Business Schools, France	Entrepreneurial Innovation; Digital Supply Chain Innovation
1999-2002	Software Systems, SCM	SAP Labs (Palo Alto, CA); SAP AG (Waldorf), SAP Japan
1995-1998	Assistant XV to Mayor	City and County of San Francisco, CA (appointed to SFUSD)
1998-1999	Visiting Fellow	Cisco Systems, San Jose, CA (Cisco Networking Academy)
1999-present	Consulting	List of companies/governments listed in academic version of CV

R&D COLLABORATIONS ACADEMIC-INDUSTRY • MANAGEMENT • ORGANIZATIONAL SKILLS • LEADERSHIP

- MIT Auto ID Center, Technology Board (1999-2004) • IoT (Internet of Things) & RFID (radio frequency id)
- MIT Forum for Supply Chain Innovation (2001-2009) • Digital Supply Chain
- MIT Data Center (2003-2006) • Semantics and Data
- MIT Sloan School of Management, Executive Education in Strategy and Management (programs 2002-2007)
- Medical Device Interoperability Program (MDPnP Lab), Massachusetts General Hospital, Harvard Medical School
- IoT in industry sponsored organization (Industrial Internet Consortium, 2013-2016) Founding Senior VP, Industrial Internet Consortium (IIC)
- Supply Chain Forum, Helsinki, Finland (2005-2008)
- Center for Innovation in Distributed Systems, Tralee, Ireland (2008-2013)

SKILLS / ATTRIBUTES

- Analytical critical thinker; serenity, strength, and stability
- Excellence in communication and multi-organizational administration
- Analysis of complex issues, outreach to governments, communities and donors
- Strategic leadership for funding initiatives, government-industry-academic liaison
- Provides thought leadership for convergence of public-private partnerships (PPP in R&D)
- Executive education for strategy, digital operations and innovation in supply chain management
- Digital transformation, network of R&D, management of technology innovation, public-private partnerships
- Public K-16 education, STEM/STEAM initiatives, professional development <https://dspace.mit.edu/handle/1721.1/146640>

SHOUMEN DATTA - SUMMARY (PART 2 of 6 – BIOMEDICAL RESEARCH)

Molecular biologist (PhD) with broad bio-medical research (lab) expertise. Experience in research supervision, coordination and advising. Skilled communicator, published in science & engineering. Intuitive sense of trans-disciplinary creative convergence (connecting the dots).

SCIENCE ▪ RESEARCH

KNOWLEDGE

- PhD in Molecular Biology (biochemistry, microbiology, virology, molecular genetics)
- Research related to role of bacterial small RNA (sRNA) in regulation of bacterial gene expression (*in vivo*)
- Research related to mutational analysis and sequencing of SV40 genome to dissect the molecular functions of large T-antigen
- Research related to exploring/creating monoclonal antibodies (against fragments of wild-type and mutated large T-antigen)
- Research in molecular genetics of transcriptional regulation in DNA tumor viruses (Adenovirus, AAV, SV40, BK-virus)
- Research on transcriptional control *in vitro* to analyze point mutations (of promoters, enhancers) affecting rates of transcription
- Research to explore synthetic peptides (active sites? target epitopes?) on rate of *in vitro* transcription (null/activation/inhibition)
- Research on hormone-dependent (?) assembly of transcription factors on transcriptional initiation for neuro-endocrine cancers
- Research related to clinical applications of hormone treatment for thyroid cancer (thyroid hormone receptor family, genetic defects)
- Research related to clinical applications of glucocorticoid treatment for neuro-endocrine tumors (glucocorticoid receptor families)
- Research to optimize biochemical purification of thyroid hormone receptors (protein chemistry) - Baculovirus expression (insect cells)
- Research to study thyroid hormone receptors (purified protein) using *in vitro* gene expression with/without thyroid hormone
- Research related to yeast genetics to optimize sources for biochemical purification of individual yeast transcription factors
- Research related to transcription initiation and elongation *in vitro* using individual transcription factors purified from yeast
- Research related to sequence of transcription factor assembly on promoters (*in vitro* assay) using purified transcription factors
- Research related to yeast genetics to optimize yeast artificial chromosomes (YACs) to clone human DNA (>10 MB) fragments
- Research to optimize DNA yield from YACs with human DNA fragments for mapping/sequencing by Human Genome Project
- Research related to genetics of RNA Polymerase II / III transcription in parasites (*Trypanosoma brucei* and *Plasmodium falciparum*)
- Research result analysis of RNA Polymerase II (specifically, C-terminal repeats in “tail”) in humans versus parasites
- Research to optimize *in vitro* transcription of *T. brucei* genes (RNA Pol II? / RNA Pol III?) using cell-free extracts (human cell lines)
- Research to create nano-sensors (laser inscribed graphene) for detection of SARS-CoV-2 using embedded Spike protein
- Review of SARS-CoV-2 with respect to [i] molecular biology, [ii] molecular diagnostics, [iii] bio/nano sensor engineering
- Review of transgenic plant-based edible vaccines for low-cost vaccination (global immunization for less affluent nations)

SKILLS

Recombinant DNA tools	DNA/RNA gel electrophoresis / analysis	Human Genome Project, YACs
Protein Chemistry / Purification	Cell Culture / Viral stocks, maintenance	Gene expression assays (<i>in vitro</i> , <i>in vivo</i>)
Cell-free <i>in vitro</i> transcription assays	Excellence in communication & teaching	Computer / information technologies
Nano-Bio Sensors / sensor engineering	Organizational operations management	Management of technology/innovation

ABILITIES

- Ability to pursue results (rational) through dedicated performance as a measure of purpose, credibility, and personal integrity
- Focused, an abundance of initiative, self-motivated, detail oriented, critical, and analytical thinker, team-community contributor
- Broad grasp of research ecosystem (academic research, entrepreneurial innovation, industrial R&D, funding, grants, donors)
- Passionate about need for future capacity (mentoring; supervising research; research programs; collaborative alliances/partners)
- Multi-cultural sensitivity to people, places and protocols as well as diplomacy, privacy and confidentiality in communications.

ADDITIONAL

- Patent law related research (litigation support) consultant for Perkins, Smith & Cohen (Boston, MA) and Burns & Levinson (Boston, MA)
- Patent law related research for US Army Natick Labs (Massachusetts), Air Force Research Labs (Ohio), and RTI Surgical (Gainesville, FL)

SHOUMEN DATTA - SUMMARY (PART 3 of 6 – INDUSTRY & GOVERNMENT)

2000-2023 ● Analyst, Advisory and Consulting Experience in Industry & Government (under NDA)

INDUSTRY AND CORPORATIONS

SAP	ERP Software, SCM, RFID, IoT
IBM	Digital Value Networks
GE	Industrial Internet (IIoT)
P&G	Transparency of SCM
Koch	Digital Transformation
PepsiCo	Supply Chain Management
Xerox	Intelligent PLM
Intel	RFID, IoT, digital SCM
Volvo	Intelligent Decision Systems
Tata (Tata Steel)	Supply Chain Planning
Siam Cement	Supply Chain Networks
Michelin	Inventory Data, SCM Network
Hitachi	RFID, Asset Management
Airbus	RFID, Spare parts inventory
General Motors	RFID, Spare parts inventory
AAR	Data, SCM, Digital Transform
Kone	Intelligent PLM
Nokia	Data, PLM
Chi-Mei	Digital healthcare infrastructure
LogicaCMG	SCM, value networks
CapGemini	RFID, Digital SCM, IoT
Sony	RFID in manufacturing
Mitsubishi	RFID in heavy industry
TEPCO	Internet infrastructure, IPv6
Huawei	IoT and Industrial IoT
TCS	Data, Artificial Intelligence
Fujitsu	IoT, Data, Analytics, AI
TechMahindra	IoT, Medical Devices
Accenture	IoT, Analytics, AI, Digital Twins
Deloitte	Healthcare Information Tech
Braun	Medical Devices, Cybersecurity
Infosys	IIoT, Data, Analytics, AI, ML

GOVERNMENTS AND GLOBAL AGENCIES

WCO/WTO	Customs & Excise (US DHS)
AOK (DE)	Digital Transformation, Healthcare
WCO (EU)	Security and Cybersecurity
DHS (US)	Risk in security, CBP & ACE
UN / UNDP	South-South Technology Transfer
ITRI, III (TW)	IoT, Industrial IoT, Data, Sensors
MOEA (TW)	IoT, IIoT, Online Education
STAG (TW)	RFID and Digital SCM
TEKES (FI)	SCM, PLM, Data, Analytics, IoT
Ireland	Innovation (Energy)
India	Customs Bureau, Excise, Duty
DoD (US)	US Army Materiel Command
GAO, NAS (US)	Cybersecurity, IoT, Industrial IoT
DoC (US)	Workforce, Economic Growth
State of California	Public K-12 Education (SFUSD)

- Familiar with funding sponsors in DC (federal), industry, organizations (foundations, agencies).
- Experience with calls (RFA/RFP, RO1, F31, T32, BAA) for funding which includes, but is not limited to industrial R&D, DoD, ARPA-E (DoE), NSF, NIH, FDA, HHS, USDA, DoT, DARPA, NASA, DHS, SBIR-STTR (SBA).
- Helped to create/manage 5 global consortiums (nexus of academia, industry and governments) & nationwide taskforce for US (economy & technology workforce).
- Mentor and advise research and innovation teams, faculty, entrepreneurs, consultants, VCs, technocrats/bureaucrats to prepare R&D proposals/identify funding from global actors.
- Sourced teams of experts for R&D contractors (sequence project execution strategy based on consulting with clients).
- Entrepreneurial innovation management and digital transformation (long term planning & short term actions).

● SELECT ANONYMIZED OUTCOMES ARE IN PUBLICATIONS

Google Scholar ● <https://bit.ly/Google-Scholar-SD>

MIT Library ● <https://dspace.mit.edu/browse?authority=a519e2baafbe5f01e490c4e3b80cc4f3&type=author>

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SHOUMEN DATTA – SUMMARY (PART 4 of 6 – CONSULTING, ADVISING & ANALYST)

Includes consulting with investment banking, venture capital, patent law firms, government agencies.

● BUSINESS ANALYST ● TECHNOLOGY

Business Process, Standards, Collaboration, Interoperability, Internet of Things (IoT), Industrial Internet of things (IIoT), Medical Internet of Things (MIoT), RFID, Data, AI, ML, DL, Cloud Computing, Information Transparency, Software, Enterprise Resource Planning (ERP), Additive Manufacturing

● BUSINESS ANALYST ● STRATEGY

Competitive Advantage, Differentiation, Data, Statistical Tools, Market Research, Business Development, Innovation and Management of Technology, Technical Platforms and Integration

● BUSINESS ANALYST ● SUPPLY CHAIN MANAGEMENT

Supply-Demand Networks, Goods Production and Distribution Routing, Transportation, Vendor Management of Inventory, Dynamic Pricing, Value Added Delayed Differentiation at the Edge, Data Acquisition Nodes, Digital SCM with Radio Frequency Id (RFID) Tools / SYSTEMS

● BUSINESS ANALYST ● PUBLIC PRIVATE PARTNERSHIPS

Collaborations, Consortiums, Customer Groups, Academic-Industry-Government Liaison, Multi-National Groups and Global Agencies.

● RESEARCH ANALYST ● MEDICAL RESEARCH

Virology, Cancer, Molecular Biology, Genetics, Endocrinology, Neurology, Infectious Diseases, Parasitology, Cell Biology, Tissue Culture, Protein Chemistry, Biochemistry, Physiology, Federal Grants and Research Funding

● RESEARCH ANALYST ● ENGINEERING RESEARCH

Energy, Graphene Sensors, Sensors for SARS-CoV-2, Sensors for heavy metal contaminants, biosensors for bacteria in food supply chain, soil and water, remote monitoring for environmental and agricultural use, sensor networks & data/informatics, Federal Grants

● SCIENTIFIC ANALYST ● HEALTHCARE ENGINEERING

Medical Device Interoperability, Data interoperability standards, Quality of data, Electronic Health Records (EMR), Cybersecurity <https://dspace.mit.edu/handle/1721.1/140303>

● ANALYST ● PUBLIC EDUCATION / PUBLIC SECTOR

Administrator - public school district, Assistant to Mayor, network infrastructure, district IT planning, STEM professional development - <https://dspace.mit.edu/handle/1721.1/146640>

● ANALYST ● DEFENSE / MILITARY

Defense logistics agencies, data standards, military aircraft repair and maintenance (MRO) supply chain operations, product lifecycle (PLM)

● ANALYST ● GOVERNMENTS / AGENCIES

Customs & Trade shipping manifest harmonization protocols (World Customs Organization, World Trade Organization) with US DHS CBP, US Department of Commerce (NTIA, NIST), UN South-South Cooperation Program (UNDP), Science & Technology Advisory Committees

SHOUMEN DATTA - SUMMARY (PART 5 of 6)

CONTRIBUTIONS – CORPORATE CONSULTANT, INDUSTRY AND GOVERNMENT ADVISOR

- I helped to lead change in business, technology and education by creating organizations that did not exist before. I also contributed to economic growth through global innovation due to radio frequency identification (RFID) of objects and the pursuit of internet of things (IoT) as a result of the ecosystem created by RFID and its integration with software and ERP for real-time data and analysis with potential for exploring use of ML and artificial intelligence algorithms for decision support.
- I was involved in leading people and the management of the various organizations involved in the management of technology which had applications in almost every vertical including energy, healthcare, manufacturing, retail, logistics, aviation, automotive, food, farming, agriculture, spare parts management, ordnance maintenance, etc.
- I co-developed models of operational transparency which could generate new business models and created tools (published ground breaking ideas and also collaborated with Nobel Prize winning economists) which was disseminated through management executive education programs related to strategy, innovation and entrepreneurship including supply chain operations management, predictive analytical data models (*before* advent of big data), security risk analysis and value network optimization relevant to business, industry, government and security operations in global goods movement (customs, tariff).
- I acted in advisory capacity to a few Fortune 500 companies, various US government agencies, organizations, foreign governments and global academic institutions to articulate, communicate and educate strategic nodes and points of influence with respect to [a] new tools to create new dimensions of socio-economic growth, [b] technologies that may benefit from tech transfer systems, [c] creation of intellectual property (IP) due to advances that may stem from some of these fundamental proceedings, [d] integration of pragmatic knowledge with community college and secondary education (to maintain the supply chain of talent quintessential for the future of progress from innovation), [e] patent law related litigation support.

SHOUMEN DATTA - SUMMARY (PART 6 of 6 PUBLICATION organized by CATEGORIES)

CATEGORIES (for list of publications organized by categories see pages 47-55)

- Medical Research, SARS-CoV-2 Sensors, Public Health, Neuro-Endocrinology
- Healthcare, Bio-medical Engineering, Medical Devices, Data & Analytics
- Sensor Engineering, Sensor Networks, Data & Analytics
- Digital Transformation, Internet of Things (IoT)
- Operations Management, Supply Chain, RFID, IoT
- Energy Innovation (renewables, biosystems innovation)
- Public K-16 Education, STEM, Professional Development

EDUCATION & TRAINING

UNIVERSITY OF CALIFORNIA, SAN FRANCISCO (UCSF SCHOOL OF PHARMACY) PHARM.D (<i>awarded</i>) https://ucsf.brightcrowd.com/pharmacyreunion-2023/shoumen-austin-datta	1998
UNIVERSITY OF CALIFORNIA, BERKELEY Communications Network Engineering (<i>audit</i>)	1995
UNIVERSITY OF CALIFORNIA, SAN FRANCISCO (SCHOOL OF MEDICINE) Research Associate (Molecular Parasitology & Infectious Diseases)	1994-1995
MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MA Post-doctoral (Transcription, Molecular Biology, Cancer, Human Genome Project)	1991-1994
HARVARD MEDICAL SCHOOL, MASSACHUSETTS GENERAL HOSPITAL Research Fellow in Medicine: Thyroid Lab, Molecular Oncology, Neuro-Endocrine Lab	1989-1991
RUTGERS UNIVERSITY SCHOOL OF MEDICINE, NEW JERSEY PhD in Molecular Biology (Biochemistry, Genetics, Virology, Microbiology, Cancer Biology)	1990
PRINCETON UNIVERSITY, NEW JERSEY PhD research collaboration (molecular virology and peptide synthesis)	1986-1987
UNIVERSITY OF PITTSBURGH, PENNSYLVANIA Master's (equivalent) in Molecular Biology	1985
Université Pierre-et-Marie Curie, Institut du Cancer et d'Immunogénétique, Hôpital Paul Brousse Visiting Student, Research (molecular biology of DNA tumor viruses, Laboratory of Dr Mirek Hill)	1982
PRESIDENCY COLLEGE, UNIVERSITY OF CALCUTTA Bachelor's degree (Honours) in Physiology and Biochemistry (Physics and Chemistry, minors)	1980
UNIVERSITY OF CAMBRIDGE, UK Indian School Certificate, Local Examinations Syndicate	1975

PROFESSIONAL APPOINTMENTS, AFFILIATIONS AND EXPERIENCES

Harvard Medical School

- Fellow in Medicine (Research) / Research Fellow, Harvard University 1989-1991
 - Massachusetts General Hospital, 55 Fruit St, Boston, MA 02114
 - Molecular endocrinology; Thyroid Laboratory
 - Neuro-endocrine tumors; Neuro-endocrine Laboratory
 - Transcriptional regulation *in vitro* by Thyroid Hormone Receptors
 - Mechanism of action of Glucocorticoid / Thyroid Receptors
 - Human Thyroid Hormone Receptor (hTHR) recombinant protein production
 - Baculovirus recombinant protein purification; Isolation of recombinant hTHR
 - Molecular Medicine: molecular oncology - treatment regimen of thyroid cancer

Harvard Medical School

(continued)

- Instructor in Biochemistry and Metabolism 1990-1993
 - Harvard Medical School, 25 Shattuck St, Boston, MA 02115
 - Teaching first year medical (MD) students
 - Tutor in New Pathway System (biochemical physiology, metabolic regulation]
- Senior Scientist @ <https://mdpnp.mgh.harvard.edu/> 2014-present
 - Massachusetts General Hospital
 - Partners Healthcare Research Building, 65 Landsdowne St, Cambridge, MA 02139
 - Department of Anesthesiology (Research); Anesthesia, Critical Care, Pain Med
 - Medical Device Interoperability - MDPnP (Medical Device Plug-n-Play) Lab
 - Cybersecurity issues - device, data, network, wired/wireless transmission, EHR
 - Medical Internet of Things (IoT) and medical device cybersecurity risks/threats
 - Medical device integration for patient safety (infectious diseases, Ebola virus)
 - Patient-centric integration of data (fusion) for physiological status (information)
 - Device data convergence platform (post-surgical patient controlled analgesia)
 - Center for Smart and Autonomous Medical Systems (SaAMS)
 - <https://mdpnp.mgh.harvard.edu/saams-center/>
 - <https://mdpnp.mgh.harvard.edu/saams-cc/>

Massachusetts Institute of Technology

- Research Associate, Whitehead Institute (for Biomedical Research) 1991-1994
 - Transcriptional regulation in yeast (*Saccharomyces cerevisiae*)
 - Protein chemistry (purification of individual transcription factors)
 - Transcriptional reconstitution of RNA Polymerase II initiation complex *in vitro*
 - RNA Polymerase II dependent gene expression and regulation
 - Human Genome Project (sequencing of the human genome transforms biology)
 - Yeast Artificial Chromosomes (YAC)
 - Optimization of human genome packaging in YACs
- Technology Board Member, MIT Auto-ID Center 1999-2004
 - Radio frequency identification (RFID) using electronic product code (EPC)
 - Standardization of the RFID electronic product code (EPC)
 - Global consortium to demonstrate item level application of RFID EPC
 - Connecting objects with object (things) data to create IoT (Internet of Things)
 - RFID and Internet of Things (IoT) transforms the transparency of location id
 - RFID and IoT ushers in the digital supply chain and digital transformation
 - MIT Auto-ID Laboratory – IoT <https://dspace.mit.edu/handle/1721.1/117273>
- Co-Founder and Executive Director, MIT Forum for Supply Chain Innovation 2001-2006
- Research Director, MIT Forum for Supply Chain Innovation 2006-2009
- Research Scientist, Engineering Systems, Civil and Environmental Engineering 2001-2009
 - Created consortium to explore emerging trends in global supply chains
 - RFID item-level data for supply chain management (SCM) decision support
 - High volume granular data (RFID and IoT) in forecasting / predictive analytics
 - Forecasting tools using error-correction techniques from financial econometrics
 - Applying GARCH (generalized autoregressive conditional heteroskedasticity)
 - Advising US and other foreign governments and global corporations (SCM)
 - Innovation courses (Sweden, Finland, France, Germany, Taiwan, Japan, India)
 - US Army (DoD) logistics
 - Education (teaching) related to SCM strategy and operations management

Massachusetts Institute of Technology (continued)

- Board Member, MIT Data Center 2003-2006
 - Barriers to software integration (syntax/semantics/standards)
 - M-language (a numerical model for semantics)
 - Digital semantics using 128-bit IPv6 (internet protocol version 6) as a format
 - Agent-based models for predictive analytics (using data integration / fusion)
 - https://web.mit.edu/edmund_w/www/DATACENTERpeople.htm

- MIT Sloan School of Management 2003-2006
 - Executive Education: Strategy and Management (co-lecturer)
 - MIT-Singapore Alliance: Forecasting (guest lecturer)
 - MIT Sloan Fellows Program: Digital Supply Chain (guest lecturer)

- Member, MIT Energy Initiative 2008-2009
 - Energy efficiency
 - Mesh network of sensors for energy optimization
 - Wireless sensor networks (WSN) in monitoring / energy savings (start-up)

- Research Affiliate @ <https://autoid.mit.edu/shoumen-datta>
 - Department of Mechanical Engineering, School of Engineering 2014-present
 - Senior Member, MIT Auto-ID Labs, Dept of Mechanical Engineering 2014-present
 - Internet of Things (IoT) <https://ilp.mit.edu/node/23302>
 - Industrial IoT <https://dspace.mit.edu/handle/1721.1/117273>
 - Medical IoT <https://dspace.mit.edu/handle/1721.1/153283>
 - Cybersecurity <https://dspace.mit.edu/handle/1721.1/140303>
 - Digital Twins <https://dspace.mit.edu/handle/1721.1/140791>

Industrial Internet Consortium (IIC) 2013-2016

- Founding Senior Vice President, IIC
- Affiliated with Object Management Group
 - Created consortium for the future of industrial internet of things (IIoT)
 - Semi-autonomous freight transportation initiative (SAFTI)
 - Medical IoT and medical device interoperability standards
 - European Union Horizon 2020 Industrie 4.0 programs (grant funding)
 - NIST CyberPhysical Systems, Smart Cities and Timing (working groups)
 - Sales of IIC membership and marketing for IIC test bed collaborations (global)

Purdue University 2015-2020

- Purdue Polytechnic
 - School of Engineering Technology
 - National Science Foundation - Industry/University Center for Research Collaboration
 - Robotics Accelerator
 - NSF I/UCRC - Robots and Sensors for Human Well Being (RoSeHuB)
 - Consortium to advance collaborative robotics (sales and marketing)
 - RoSeHuB <https://www.purdue.edu/rosehub/RoSeHUB.contact.html>

USDA (US Department of Agriculture)

2018-2024

■ National Institute for Food and Agriculture (NIFA)

- SmartPath CoE (Center of Excellence), University of Florida, Gainesville, Florida
 - Research coordinator for multi-university project (sensors in agri-systems)
 - University projects involve research, teaching and extension (field applications)
 - Research related to use of printed graphene sensors for contaminants/microbes
 - Sensor data and analytics to optimize information-informed decision support
 - Data fusion/platforms for convergence of data to extract actionable information
 - SmartPath Universities:
 - ◆ University of Florida
 - ◆ University of Iowa
 - ◆ University of Maryland
 - ◆ University of Wisconsin
 - ◆ Texas Agricultural & Mechanical University
 - ◆ Clemson University

■ Multi-university USDA (“SmartPath” Center of Excellence) funded R&D activities:

- ◆ Fiscal, budgetary, programmatic support (\$5 million grant application, 2017)
- ◆ Industry partnerships, industry-academic funding search, industrial liaison
- ◆ Research networks, partner events, industry funded initiatives (NSF I/UCRC)
- ◆ Advise team on software systems, data analytics, decision support systems
- ◆ Coordinate SmartPath seminars, workshops, meetings, symposia.
- ◆ Develop and analyze research activities and extension studies.
- ◆ Update issues regarding policies, procedures, and processes (if necessary)
- ◆ Assist in development of websites through OPS employees and contractors.
- ◆ Mentor research staff, students, OPS, other research/extension team members.

■ Engaged with research administration and research activities:

- [0] nano-bio sensors (laser inscribed 3D printed graphene - turbostratic graphene)
- [1] sensor data from detection of pathogens and heavy metals (irrigation water)
- [2] sensor data science in decision support for end-users (extension, field worker)
- [3] field applications for real-time data informed decision optimization via IoT devices
- [4] student training and extension programs with academic partner universities (UF, Iowa State U, Texas A&M U, U of Maryland, Clemson U, U of Wisconsin-Madison).
- [5] SmartPath relevant recent publications <https://bit.ly/Google-Scholar-SD>
- [6] Collaboration <https://dspace.mit.edu/handle/1721.1/123983>

NIH (National Institutes of Health, US Department of Health and Human Services)

2020-2023

■ RADx-RAD (RADxSM Radical Program)

- Clemson University, BioSystems Engineering, Computing & Applied Science (ECAS)
 - Non-traditional diagnostics for CoVID-19 testing and public health surveillance
 - Effective and efficient tests to identify SARS-CoV-2 virus and its variants
 - Platform tools to detect and combat emerging/future infectious disease agents
 - Mobile-connected, low-cost, lab-less, rapid tests for anytime-anywhere use
 - Mobile data crowd-sourcing and in-network analysis to monitor transmission
 - Real-time data-informed predictive models, data distribution, decision support

SAP (Systeme, Anwendungen und Produkte in Der Datenverarbeitung, Walldorf, Germany)

- SAP Labs, Palo Alto, California, USA 1999-2003
- SAP AG, Walldorf, Baden-Württemberg, Germany 2000-2003
- SAP Japan, Otemachi, Chiyoda, Tokyo, Japan 2000-2003
 - Principal Investigator, Software Application Development
 - Strategic Innovation (RFID data-informed digital supply chain operations)
 - Global initiatives and management of technological innovation
 - Supply Chain systems: high tech business, e-commerce, semiconductor industry
 - Strategic Technology Advisor (Advanced Planner & Optimization, SAP Japan)
 - Adaptability of (business) networks using RFID, IoT and Agent-based software
 - Public communication (ghost writer, books); pre-sales, sales and marketing
 - Store of the Future (global corporate team for in-store RFID implementation)

Associated Scientists 1996-1999

- President and Co-Founder
- Founder & Executive Director, Glenn T Seaborg Endowment for Excellence in Education
 - Initiative to improve K-12 curriculum in mathematics and science, State of California
 - Foundation to support professional development of K-12 STEM teachers, California
 - Scale the Josephine Miles Fellows Program, University of California, Berkeley
 - Summary “Education” – MIT Library <https://dspace.mit.edu/handle/1721.1/146158>

Eagle Alliance 1998-1999

- Senior Advisory Council
- Public Understanding of Science, Dept of Nuclear Engineering, Texas A&M University
 - Public awareness about nuclear waste storage and disposal
 - Public literacy about under-utilization of safe nuclear energy
 - Public communication about the energy economics of dependence on fossil fuels

National Information Technology Task Force (National IT Workforce Development) 1997-1998

- Chairman of the Task Force
- US Departments of Commerce, Labor and Education
- White House Council of Economic Advisors
- Information Technology Association of America (ITAA)
- University of California, Berkeley
 - Policy advisory task force
 - Skills shortage and its local/global economic impact
 - Secondary and post-secondary (community colleges) engagement
 - Initiatives for IT workforce development (up-skilling/re-skilling, re-training)
 - Cisco Networking Academy – national program rollout
 - Cisco Fellow at Cisco Systems, 170 West Tasman Drive, San Jose, CA 95134
 - Networking as a part of the high school curriculum (implemented in SFUSD)
 - Promotions, communications, sales and marketing for adoption of Cisco CNA

City and County of San Francisco, California 1995-1997

- Special Assistant [Title XV], Office of the Mayor, City and County of San Francisco
- Special Assistant to Superintendent of School, San Francisco Unified School District (SFUSD)
- Director of Development and Strategic Technology, San Francisco Unified School District
 - Mathematics and Science (STEM) in SFUSD high schools and middle schools
 - High school program in molecular biology and recombinant DNA laboratories
 - Teacher recruitment
 - Assistance with curriculum and professional development (content, training)
 - Science Education Partnership (SEP) with UCSF School of Medicine
 - Teacher development program with University of California, Berkeley
 - Distinguished Lecture Series in high schools
 - Management and administration of technology infrastructure for SFUSD
 - Connecting schools to the internet
 - Co-organizer of NetDay 1996
 - Co-founded Cisco Networking Academy at Thurgood Marshall Academic HS
 - Online Interactive University Project (MOOC) between UC Berkeley / SFUSD
 - Grant funding for SFUSD network (US Department of Commerce, Pacific Bell)
 - Computers for Schools Program (NASA Ames, Detwiler Foundation)

University of California School of Medicine, San Francisco (UCSF), California 1994-1995

- Research Scientist, UCSF - UC Berkeley Program in Molecular Parasitology
- Instructor in Human Genetics (for first year MD students)
 - Infectious Diseases and Molecular Parasitology
 - Trypanosomiasis (*Trypanosoma brucei*)
 - Developed *in vitro* transcription assay
 - Variant surface glycoprotein VSG & procyclic acidic repetitive protein PARP
 - RNA Polymerase II and III transcription from VSG & PARP promoters *in vitro*
 - Developmental aim: molecular targets for pharmacological drugs and inhibitors

PARTIAL LIST OF OTHER KSA's ■ KNOWLEDGE, SKILL, ABILITIES

- US Federal Information Security Management Act FISMA
- NIST Cybersecurity Framework for Internet of Things (IoT) / IIC Framework for Industrial IoT Cybersecurity
- Internet of Things (IoT) / Industrial Internet of Things
- Medical Internet of Things (MIoT), Digital Twins (DT)
- Medical Devices and Data Interoperability / Integrity
- Healthcare Cybersecurity Risks and Data Confidentiality
- CyberPhysical Systems / concept of system of systems
- Time Sensitive Networks / Assurance in software systems
- Autonomous vehicles /collision avoidance issues
- Digital transformation / Entrepreneurial Innovation
- Electronic health/medical records (EHR/EMR)
- Operation Theatre of the Future, Medical Devices
- Digital health / remote monitoring for at-home health
- IPv4, IPv6, principles of machine learning (ANN, AI)
- Trans-disciplinary/multi-disciplinary convergence
- Grant funding, project management, research support
- Business development, pre-sales, sales and marketing
- Patent law research (R&D litigation support consultant)
- Sensors / Wireless Sensor Networks
- Sensor data / information from data
- Energy sensors / smart cities
- Water and food sensors / agri systems
- Waste-water surveillance (viruses)
- Descriptive, Predictive, Preventive Analytics / Platforms for data fusion
- Econometric techniques in analytics
- Supply chain, operations management
- Forecasting, supply network planning
- RFID data in digital supply chain
- Training / workforce development
- Teaching / executive education
- STEM / public & community outreach
- Communication (verbal and written)
- Organization (conference, consortium)
- Building organizations/centers/forums
- Thought leadership / connecting dots

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RECENT SCIENTIFIC RESEARCH PUBLICATIONS • <https://bit.ly/Google-Scholar-SD>

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Datta, Shoumen (2023) *The Health of Nations: Plant-Based Oral Vaccines* (in review) Presentation is available from the MIT Library <https://dspace.mit.edu/handle/1721.1/145774>

McLamore, Eric S. and **Datta**, Shoumen P.A. (2023) *A Connected World: System-Level Support through Biosensors* Ann Rev Analytical Chem vol. 16 <https://doi.org/10.1146/annurev-anchem-100322-040914>

Enoch Kuo· Nicholas D. Cavallaro· Yue Rong Dong Xiang· Zöe Davis, Yang Shen, Shoumen P.A. **Datta**, Carmen Gomes, Eric S. McLamore (2023) *COBOTS: All-carbon origami box array for multiplex point of use water quality sensing* (in press)

Geisianny Moreira, Delphine Dean, Hanyu Qian, Shoumen **Datta**, Nikolay Bliznyuk, Diana Vanegas and Eric McLamore (2023) *Development of a DNA aptamer-based electrochemical biosensor for detection of SARS-CoV-2 Omicron in saliva*. 33rd Anniversary World Congress on Biosensors (June 2023, S. Korea).

Nicholas Cavallaro, Dong Xiang, Shoumen P.A. **Datta**, Carmen Gomes, and Eric S. McLamore (2023) *Multi-aptamer targeting of Listeria monocytogenes in agricultural waters using laser inscribed graphene sensors*. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4367488

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Geisianny Moreira, Lisseth Casso Hartmann, Shoumen PA **Datta**, Eric S McLamore, Diana Vanegas (2022) *Development of an ACE-2 biosensor for point-of-need saliva diagnostics and surveillance of SARS-CoV-2*. Biomedical and Physiological Sensor Technology XIV, 2022; PC1212303. SPIE.

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PUBLIC EDUCATION – MATHEMATICS & SCIENCE (STEM) IN K-12 SCHOOLS

Datta, S. (2022) *A Nation in Progress*. (working paper) <https://dspace.mit.edu/handle/1721.1/146640>

Datta, S. (2010) *Entrepreneurial Innovation* <http://dspace.mit.edu/handle/1721.1/54837>

Waltar AE, Beaumont P, Earl B, Peddicord KL, Datta S. 1999. What The Public Wants to Know. Proceedings of the American Nuclear Society. Long Beach, CA.

Datta, S. (1998) National Task Force (US) Report. US Dept of Commerce & ITAA, Washington, DC

Datta, S. (1998) Community Colleges as Catalysts for Economic Growth through IT Centers

Datta, S. (1997) Integrated Network for Education [Education Commission, US Senate, 1999]

Datta, S. (1997) Science Education and Economic Growth

Datta, S. (1997) Public Education [Interview]

Datta, S. (1996) Good Teaching [Letter] *Science* **271** 1789

Datta, S. (1996) Retrofit Public Education: Science and Technology Education Partnership for Schools

Datta, S. (1996) Standards: The Widening Gulf Between Concepts and Implementation

Datta, S. (1995) Partnership for International Public Health: Molecular Diagnostics and Public Issues

Datta, S. (1995) Art and Education: Value of Public Museums to Science Education

Datta, S. (1995) Interactive Mathematics: Experimental Concept Gone Awry

BIOMEDICAL RESEARCH

Datta, S. (1989) Transcriptional Activities of the 289 amino acid Adenovirus 2 E1A Protein in vitro (PhD thesis) Rutgers University School of Medicine, New Jersey.

Datta S, Soong CJ, Wang DM, Harter ML. 1991. Purified Adenovirus 289R E1A Protein Stimulates Pol III Transcription in vitro by altering transcription factor III_C. *J. Virology* **65** 5297-5304
<http://jvi.asm.org/cgi/reprint/65/10/5297>

Datta S, Magge S, Madison L, Jameson JL. 1992. Thyroid Hormone Receptor Mediates Transcriptional Activation and Repression of Different Promoters. *Molecular Endocrinology* **6** 815-825
<https://academic.oup.com/mend/article/6/5/815/2714624>

Putlitz J, **Datta S,** Madison L, Jameson JL. 1991. Human Thyroid Hormone Receptor Produced in Recombinant Baculovirus-infected Insect Cells. *Biochem & Biophys Research Com* **175** 285-290
<https://www.sciencedirect.com/science/article/abs/pii/S0006291X0581232X?via%3Dihub>

Chatterjee VKK, Nagaya T, **Datta S,** Madison L, Rentoumis A, Jameson JL. 1991. Thyroid Hormone Resistance Syndrome: Inhibition of Normal Receptor Function by Mutant Thyroid Hormone Receptors. *J. Clin Invest* **87** 1977-84 www.ncbi.nlm.nih.gov/pmc/articles/PMC296951/pdf/jcinvest00078-0109.pdf

Rentoumis A, Chatterjee VKK, Madison L, **Datta S,** Gallagher G, DeGroot LJ, Jameson JL. 1990. Negative and Positive Transcriptional Regulation by Thyroid Hormone Receptor Isoforms. *Molecular Endocrinology* **4** 1522-1531 <https://academic.oup.com/mend/article/4/10/1522/2714015>

Datta S, Spangler R, Bruner M, Harter ML. Activation of viral and non-viral promoters by the Adenovirus 289R E1A protein in cell-free extracts. ICRF Tumor Virus Meeting, July 1987. Cambridge, UK. [Published as <https://doi.org/10.1126/science.2956686> & <https://pubmed.ncbi.nlm.nih.gov/2956686/>]

Datta S, Chatterjee P, Losada MC, Flint SJ, Harter ML. An E. coli produced E1A 289R protein and a synthetic E1A 49R peptide variably regulates Pol II and Pol III transcription in vitro. Tumor Virus Meeting, 1988. Cold Spring Harbor Lab

Datta S, Wang DM, McGrath M, Westerdahl C, Harter ML. Bacterially produced E1A 289R activates Pol III transcription through TFIIC. ICRF Tumor Virus Meeting, 1989. Cambridge, UK.

Chatterjee VKK, Madison L, Rentoumis A, **Datta S,** Gallagher G, Jameson JL. Negative regulation by thyroid hormone receptors. American Association for Cancer Research, 1990. San Diego, CA.

Jameson JL, Nagaya T, Madison L, Chatterjee VKK, **Datta S.** Transcriptional activation and repression by thyroid hormone receptors. Abstract. ICN-UCLA Symposia, 1991. Keystone, CO.

Nagaya T, Chatterjee VKK, Madison L, **Datta S,** Rentoumis A, Jameson JL. Generalized Thyroid Hormone Resistance. MGH Symposium, 1991. Boston.

Datta S, Magge S, Putlitz J, Jameson JL. Transcriptional activation and repression by thyroid hormone receptors: Development of an in vitro transcription assay. MGH Symposium, 1991. Boston, MA.

Datta S, Magge S, Putlitz J, Jameson JL. Repression of a-TSH promoter activity by thyroid hormone receptor in an in vitro transcription assay. Endocrine Society Meetings, 1991. Washington, DC.

Nagaya T, **Datta S,** Madison L, Ahlquist JAO, Magge S, Hwang YT, Jameson JL. Structural determinants of thyroid receptor interactions with DNA. American Thyroid Association 1991. Boston.

RESEARCH SUPERVISION and STUDENT ADVISING / MENTORSHIP

Year	Student	Purpose	Field	Institution(s)
1982-83	L. Pallan	Senior Thesis	Pre-Med	University of Pittsburgh, Neuro-Surgeon
1987-88	M. Losada	Junior Thesis	Molecular Bio	Rutgers University, Merck Research
1989	S. Saha	Undergraduate	Medicine	Harvard University, UCSF
1990-91	S. Magge	Senior Thesis	Medicine	Harvard, Yale, Johns Hopkins
1992	T. Galvao	Advising	Molecular Bio	MIT, University of Cambridge
1992	N. Tang	Advising	Chemistry	MIT, Yale University
1993	S. Magge	Advising	Medicine	Harvard, Yale, UC, Neuro-Surgeon
1993	A. Mukherji	Advising	Medicine, Law	Harvard University
1994	L. O'Brien	PhD Research	Infectious Dis	UCSF School of Medicine
1997	A. Pritikin	Advising	General Studies	Harvard University
1998	H. Fu	Advising	Engineering	MIT, Harvard, US DoE
2001	Y. Soga	Internship	Business	Oxford University, Finance
2001	A. Vora	Advising	General Studies	Harvard University
2003	G. Parlier	Advising	Supply Chain	US Army, National Defense Fellow
2004	H. Fu	Sponsor	Environ Sci	MIT, Harvard, British Parliament
2004	T. Shean	Advising	Physics	University of Cambridge
2004	D. Graham	Research	Econometrics	Institute for Defense Analysis
2005	K. Phillip	Research	Management	Trinity College Dublin (Ireland)
2007	K. Zukova	MS Thesis	Supply Chain	Chalmers University (Sweden)
2008	M. Marchena	PhD Thesis	Data Analytics	University of Sau Paulo (Brazil)
2012	J. Lamb	Mentor	Data Science	UC Berkeley, NVIDIA https://onceamaintainer.substack.com/p/once-a-maintainer-james-lamb
2013	T. Peerson	Advising	Chemistry	APL, Johns Hopkins University
2014	A. Boy	Advising	SCM, Data Sci	KEDGE BS (Bordeaux), MIT
2015	L. Gorantala	Advising	Neuroscience	University of Washington, Seattle
2017	A. Boussera	Advising	Public Policy	United Nations (NY), UNESCO (Paris)
2017	A. El-Adl	Advising	CS, Neurology	Yale University, MIT
2018	S. Swanson	Advising	Computer Sci	University of Florida
2019	C. Johnson	Advising	Engineering	MIT
2022	S.V.K. Das	Advising	Engineering	UC Berkeley
2022	N. Mekjan	Advising	Neuroscience	University of Cambridge, UK
2023	R. Putatunda	Advising	Computer Sci	University of Maryland (UMBC)
2024	M. Amer	Advising	Biomedical Sci	University of Florida
2024	R. Lincoln	Advising	Statistics	University of Florida

SELECTED TEACHING EXPERIENCES

- 1981-1985 Teaching Assistant in Genetics, Microbiology and Virology, University of Pittsburgh
- 1986-1988 Instructor in Molecular Biology and Microbiology, Rutgers University
- 1990-1993 Instructor in Molecular Medicine (First Year MD Curriculum), Harvard Medical School
- 2000 Guest Lecturer, MBA Program, Haas School of Business, UC Berkeley
- 2000 Lecturer, MBA, L'Ecole Supérieure des Sciences Economiques et Commerciales, Paris
- 2001 Visiting Lecturer, School of Engineering, University of Cambridge, UK
- 2002-2004 Guest Lecturer, Logistics and Supply Chain (MIT Graduate Course 1.270 / ESD.273)
- 2002-2004 Co-Lecturer, Supply Chain Strategy & Management, MIT Sloan School of Management
- 2003-2004 Co-Lecturer, Advanced Logistics and SCM Strategies, MIT-Singapore Alliance, MIT
- 2004-2005 Lecturer in Strategic Innovation, Sloan Fellows, MIT Sloan School of Management
- 2004 Guest Lecturer, Auto-ID in Supply Chain Management, HEC, Montreal, Canada
- 2005-2007 Visiting Lecturer, MBA Program, Trinity College, Dublin, Ireland
- 2006-2007 Visiting Faculty, Management of Technology Innovation, Chalmers University, Sweden
- 2006-2007 Guest Lecturer, Innovation in SCM Operations , Indian Institute of Management AMD
- 2006-2021 Innovation SCM, Institut Supérieur de Logistique Industrielle, Bordeaux (KEDGE BS)
- 2010-2013 Instructor in Chemistry, Biological Sciences, Anatomy and Physiology, Biotechnology

ANALYST, ADVISING & CONSULTING in INDUSTRY/CORPORATIONS (1999-2019)

Disclosure of topics and statements of work are prohibited to remain in compliance with NDAs

IBM	Digital Value Networks
GE	Industrial IoT ▪ RFID, UWB, Sensors, IPv6 ▪ Predictive Analytics ▪ Supply Chain
P&G	Transparency of SCM ▪ Data Flow ▪ RFID and Agents in Supply Demand Systems
Koch	Digital Transformation ▪ IoT and IIoT Data, AI, Analytics ▪ Sensors, nanotech
PepsiCo	Supply Chain Management (SCM)
Xerox	Intelligent PLM (product life cycle management)
Intel	RFID, digital SCM in retail store of the future ▪ Autonomous Transport ▪ IIoT
Volvo	Intelligent Decision Systems
Tata (Tata Steel)	Supply Chain Planning and Optimization
Siam Cement	Supply Chain Planning and Optimization ▪ Energy Efficiency ▪ Sensor Networks
Michelin	Inventory Optimization ▪ Operations Management ▪ RFID in Asset Management
Hitachi	RFID in track and trace ▪ IoT and the industrial internet ▪ Digital Transformation
Airbus	RFID in track and trace ▪ Spare parts inventory management
General Motors	RFID in track and trace ▪ Spare parts inventory management
AAR	RFID in track and trace ▪ SCM inventory management ▪ Data, Analytics, AI
Kone	Intelligent PLM (product life cycle management), digital supply chain management
Nokia	Intelligent PLM (product life cycle management), digital supply chain management
Chi-Mei	Digital interfaces in healthcare infrastructure
LogicaCMG	SCM and the evolution of value networks
CapGemini	RFID and digital supply chain ▪ IoT
Sony	RFID in semiconductor industry transparency, Global Logistics, Decision Systems
Mitsubishi	RFID in heavy industry asset management and local positioning systems (LPS)
TEPCO	Internet infrastructure. IPv6. Semantic Interoperability between intelligent systems
Huawei	IoT / Digital Transformation. Data, Analytics, AI. Intelligent Decision Systems.
TCS	Data and AI ▪ Digital Transformation ▪ Robotics and Automation
Fujitsu	IoT and Industrial Internet ▪ Data, Analytics and AI
TechMahindra	IoT/IIoT ▪ Data, Analytics, AI ▪ Medical Devices ▪ Interoperability ▪ Cybersecurity
Accenture	IoT/IIoT ▪ Data, Analytics, AI ▪ Digital Twins and Digital Transformation of SCM
Deloitte	Healthcare Information Technology (HIT)
Braun	Medical Devices ▪ Interoperability ▪ Cybersecurity
Infosys	IoT and Industrial Internet ▪ Data, Analytics, AI ▪ Autonomous Transportation

ANALYST, ADVISING, CONSULTING - GOVERNMENT & AGENCIES (2001-2019)

Disclosure of topics and statements will be unprofessional and in violation of prior agreements

AOK (DE)	Digital Transformation in Healthcare ▪ Cybersecurity ▪ Data, Analytics, AI
WCO (EU)	Security/Cybersecurity in global logistics ▪ Standards for security harmonization
DHS (US)	Risk in security ▪ ACE Program
ITRI (TW)	IoT and Industrial Internet ▪ SCM ▪ Sensors and energy efficiency
III (TW)	RFID, IoT, IIoT ▪ Digital SCM ▪ Data, Analytics, AI ▪ Cybersecurity ▪ FinTech
MOEA (TW)	IoT and Industrial Internet ▪ Digital SCM ▪ Data, Analytics, AI ▪ Education Tech
STAG (TW)	RFID and Digital SCM
TEKES (FI)	Science/Technology (Innovation, SCM, PLM, Data, Analytics, IoT, Cybersecurity)
Ireland	Prime Minister's Task Force for Innovation (Energy)
India	Customs Bureau, Ministry of Finance
DoD (US)	US Army Materiel Command, Defense Logistics Agency
GAO, NAS (US)	Cybersecurity ▪ IoT and Industrial IoT
DoC (US)	Workforce and Education for Economic Growth (National Task Force 1997-1998)
California (State)	Special Assistant to Mayor of San Francisco, K-12 Education http://bit.ly/SD-K12
NIST (US)	Public Working Groups: IoT, Cyberphysical Systems, Timing in Software Systems
PATENT LAW	Perkins, Smith & Cohen; Burns & Levinson; US Army Natick Labs; AFRL; RTI Surgical

IDEAS & INNOVATION - INVITED TALKS & EVENTS

- 1995 Berkeley Pledge Steering Committee, Education Outreach, University of California
1996 National Net Day Organizing Committee
1996-1999 Eagle Alliance, Advisory Board
2000 Guest Lecturer, Haas School of Business, University of California at Berkeley
2000 Guest Lecturer, MBA Program, ESSEC, University of Paris, Paris, France
2001 Guest Lecturer, University of Cambridge School of Engineering, Cambridge, UK
2002-2004 Lecturer, Supply Chain Management Executive Programs, MIT Sloan School
2002-2004 Guest Lecturer, Logistics & Supply Chain (MIT Graduate Course 1.270/ESD.273)
2002 Keynote Address, Supply Chain Council (SCOR), Mexico City, Mexico
2002 Keynote Address, Supply Chain Summit, Montreux, Switzerland
2002 Executive Program (Future of SCM), Saint Gobain (www.saint-gobain.com)
2003 Chairman, Executive Advisory Board, Telecommunication Summits
2003 Keynote Address, IP Summit, The Hague, The Netherlands
2003 Plenary Address, LogiChem, Frankfurt, Germany
2003 Invited Address, Supply-Chain World of North America, Atlanta, Georgia, USA
2003 Chairman, European Supply Chain Summit, Luzern, Switzerland
2003 Session Chair & Invited Speaker, InterLog Conference, Dusseldorf, Germany
2003 Chairman, Retail Revolution Europe Conference, The Hague, Netherlands
2003 Panelist, 3rd INTEL Executive Summit, San Francisco, California, USA
2003 Invited Seminar, GE Global Research, New York
2003 Chair and Keynote Speaker, LogiCon Interactive Conference, Barcelona, Spain
2003 Invited Keynote Speaker, LogicaCMG Forum, Amsterdam, The Netherlands
2003 Invited Keynote Speaker, Forum on Automation Technologies, Government of Taiwan
2003-2004 Team Lecturer, MIT-Singapore Alliance (Advanced Logistics & SCM Strategies), MIT
2004 Board of Overseers, MIT-Chile Project (MIT alliance with Govt of Valparaiso, Chile)
2004 Keynote Address, Electronics Manufacturers Association, San Jose, California
2004 Keynote, Government of Finland Science and Technology Council, TEKES (Helsinki)
2004 Invited Panelist (AAIA), Technical Excellence in Aviation, Missiles & Space (US DoD)
2004 Invited Speaker, Redstone Arsenal-Huntsville Military Operations Research Section
2004 Invited Speaker, MIT-INFORMS Practice Conference, Cambridge, Massachusetts
2004 Invited Panelist, CIO Roundtable, Airline Transportation and Retail Industries, Dallas
2004 Invited Speaker, National Economic and Social Development Board, Govt of Thailand
2004 Invited Keynote Speaker, E-Business Forum, Ministry of Economic Affairs, Taiwan
2004 Keynote Speaker, Fourth SCM Forum (Helsinki, Finland)
2004 Executive Workshop, KONE Corporation (Espoo, Finland)
2004 Keynote, 4th SCM CEO Summit, Hong Kong Article Nomenclature Association, GS1 HK
2004 Guest Speaker, MIT Sloan Fellows Program
2004 Executive Workshop, PoweredCom Inc (Tokyo Power and Electric Company, Japan)
2004 Advisor, TagArray Inc
2005 Keynote, ICT-RFID Summit, California Polytechnic State University, San Luis Obispo
2005 Invited Speaker, École des Hautes Etudes Commerciales of Montreal (HEC, Montreal)
2005 Keynote Speaker, World Customs Organization IT Conference, Istanbul (Turkey)

IDEAS & INNOVATION - INVITED TALKS & EVENTS

(continued)

- 2005 UN-UNDP Mission to China (Invited Expert Group for South-South Technical Coop)
- 2005 Invited Member, President of Taiwan Science and Technology Advisory Group, Taiwan
- 2005 Visiting Scholar, IIS, Trinity College, Dublin (Ireland)
- 2005 Advisor, SandLinks Inc
- 2005 Seminar, Transparency in the Supply Chain, US Department of Homeland Security
- 2005-2007 Keynote Speaker and Co-Organiser, SCM Forum, Helsinki (Finland)
- 2005 Invited Speaker, Council of Members, World Customs Organization, Brussels (Belgium)
- 2005-2006 Advisor to the Secretary General, World Customs Organization, Brussels (Belgium)
- 2006 Keynote, Chalmers University Executive Education Program, Gothenberg, Sweden
- 2006 Speaker, Innovation in Logistics, Ministry of Transport & Communication, Helsinki, FI
- 2006 Co-organizer, WCO Education Series in Globalisation and Interoperability, Brussels, BE
- 2006-2011 Advisor, Technical Strategy and Innovation, Decision Systems Lab, GE Global Research
- 2006 Invited Speaker, 6th Agribusiness Summit, Lexington (Kentucky, USA)
- 2006 Member, Advisory Committee, California Agricultural Leadership Foundation
- 2006 Advisor, State Board, California Department of Agriculture (Advisory Committee)
- 2006 Keynote Speaker, World Customs Organization IT Conference, Bangalore, India
- 2006 Invited Speaker, IIS-Intel Conference, Trinity College Dublin, Ireland
- 2006 Lecturer, Dept of Technology Management & Economics, Chalmers University, Sweden
- 2006-2007 Co-Investigator, SMART Project (Funded by EU), Trinity College Dublin, Ireland
- 2006-2021 SCM Innovation, Institut Supérieur de Logistique Industrielle, BEM-KEDGE, Bordeaux
- 2007 Visiting Lecturer, MBA Program, Trinity College Dublin, Ireland
- 2007 Invited Speaker, Indian Institute of Management, Ahmedabad, India
- 2007 Keynote, ELTRUN Supply Chain Innovation and RFID Symposium, Athens, Greece
- 2007 Visiting Lecturer, Athens University of Economics and Business, Athens, Greece
- 2007 Invited Speaker and Research Paper, NOFOMA Annual Conference, Reykjavik, Iceland
- 2007 Guest Speaker, Educator's Day, University of Iceland and Reykjavik University, Iceland
- 2007 Advising, Pervasive Decisioning Systems Laboratory, GE Global Research, New York
- 2007 Invited Speaker & Visiting Faculty, Lappeenranta University of Technology, Finland
- 2007 Seminar, US Department of Homeland Security, Washington DC
- 2008 Member, Editorial Board, International Journal of Electronic Business Management
- 2008 Invited Speaker, DRIVE for Growth Conference (Killarney, Ireland)
- 2008-2009 Research Advising and Entrepreneurship, Institute of Technology, Tralee, Ireland
- 2008-2009 Co-Founder, Centre for Innovation in Distributed Systems (CIDS) at ITT (www.imar.ie)
- 2008-2013 CIDS to form IMAR www.assistid.eu/host-institutions/institute-of-technology-tralee
- 2008 Co-Organizer, *Is Connecting Bits to Atoms Sufficient?* CIDS, IT Tralee, Ireland
- 2008 Visiting Lecturer in International Business, School of Business Studies, Trinity College
- 2008 Co-Organizer, *Is Forecasting Necessary?* CIDS, IT Tralee, Ireland
- 2008 Co-Organizer, *A Sense of Silence in Medicine?* CIDS, IT Tralee, Ireland
- 2008 Co-Founder and Start-up Advisor, DCS ENERGY SAVINGS PVT LIMITED
- 2009 Invited Speaker, SCM Forum IX, Helsinki (Finland)
- 2009-2010 Member and Affiliate, MIT Energy Initiative
- 2009 Start-up Advisor, InGRID ENERGY LLC (USA & IRELAND)

IDEAS & INNOVATION - INVITED TALKS & EVENTS

(continued)

- 2009 Visiting Lecturer, National Cheng Kung University & National University of Tainan
- 2011 Invited Seminar, Dept of Technology Management & Economics, Chalmers University
- 2012 Chair, Biofuel Engineering, 2nd World Congress of Bio-Energy, China
- 2013 Keynote • ISLI 25th Year Symposium, École Supérieure de Commerce de Bordeaux, FR
- 2014 Keynote • MOOC & Digital Education - Presidents' Forum of Southeast Asia (Taiwan)
- 2014 The Industrial Internet of Smart Things – Institute for Information Industry, Taipei, ROC
- 2014 Senior Advisor at Catallyst Constellations (www.catconglobal.com)
- 2014 Invited Speaker and Panelist at the CSC Aspire Conference on IoT
- 2014 Invited Seminar Speaker on Cyberphysical Systems at ISIS, Vanderbilt University
- 2014 Keynote, IoT Forum at MIT (www.iot-conference.org/iot2014/keynote-speakers/)
- 2014 EU-US Summit Speaker at the IoT Forum at MIT (BILAT USA 2014)
- 2014 Organizer • IIC Forum – *A Sense of the Future* (Austin, Texas) www.iiconsortium.org
- 2015 Invited Keynote – Planning the Future Together – [25th Forum](#) at ISLI, KEDGE, Bordeaux
- 2015 Invited Speaker - Future Strategies Workshop at Huawei Corporation
- 2015 Invited Speaker - Future Strategies Workshop at Mitsubishi Corporation
- 2015 Panelist – STEM Education, National Robotics Initiative at The White House ([OSTP](#))
- 2015 NITRD Ontology Summit <http://ontolog.cim3.net/OntologySummit/2015/schedule.html>
- 2015 Keynote • EU IoT, Lisbon, Portugal • <http://iot-week.eu/events/iot-week-lisbon/>
- 2015 Keynote • CEA LETI in Grenoble, France • <http://bit.ly/GRENOBLE-24JUNE2015>
- 2015 Keynote • Tokyo University of Science, Tokyo, Japan • <http://bit.ly/TUS-IOT-DATTA>
- 2015 Keynote • [Global Forum](#), Oulu, Finland • www.youtube.com/watch?v=1A2xTIuGPjM
- 2015 Keynote, Tampere U • www.openlivinglabs.eu/event/global-forum-shaping-future-2015
- 2015 Keynote, TEKES (Helsinki) • <https://tapahtumat.tekes.fi/event/internationalcollaboration>
- 2015 Invited Speaker • Institute for Information Industry, Taipei (Taiwan)
- 2015 International Telecommunication Union [Forum on IoT](#) • <http://bit.ly/ITU-GENEVA-IoT>
- 2015 Invited Speaker • Korea Aerospace University (South Korea)
- 2015 Keynote • South Korea IoT 2015 • <http://www.iot-conference.org/iot2015/program/>
- 2015 Invited Speaker • Strategic Advisory Council – Huawei Corporation
- 2015 Invited Speaker • University of Salamanca (Spain)
- 2015 Invited Keynote • III – Big Data Conference (Taipei, Taiwan)
- 2015 Invited Keynote • Healthcare IoT Forum at NCKU (Tainan, Taiwan)
- 2016 Invited Speaker • Mobile World Congress (Barcelona, Spain)
- 2016 Keynote and Organizing Committee – Industrial Chair for ILS, Bordeaux, France
- 2016 Invited Keynote • Industrial IoT Summit • www.industrialiotseries.com/usa/
- 2016 Keynote • Future Manufacturing, Shanghai • www.futuremanufacturingworld.com/
- 2016 Invited Speaker • Strategic Advisory Board – TE Connectivity
- 2016 Invited Speaker • Huawei STW (Science and Technology Workshop) Shenzhen, China
- 2016 Panel Member, US GAO / National Academy of Science / Engineering, Expert IoT Panel
- 2016 IoT Berlin • www.vdi-wissensforum.de/en/cesis-global-internet-of-things-conference/
- 2017 Invited Speaker • CIO/CTO Council • Koch Industries “Translational Engineering”
- 2017 Panel Member • Toronto Smart Cities • <https://www.ispim-innovation-forum.com/>
- 2017 Advisor • Advanced Silicon Group • <http://www.advancedsilicongroup.com/>

IDEAS & INNOVATION - INVITED TALKS & EVENTS

(continued)

- 2017 Keynote • Conference on Genetic and Evolutionary Computing, Kaoshiung, Taiwan
2017 Speaker • Kaoshiung University of Applied Sciences, Kaoshiung, Taiwan
2017 Speaker • Tajen University, Yanpu, Taiwan
2017 Speaker • National Dong Hwa University, Hualien, Taiwan
2017 Speaker • Mingshin University of Science and Technology, Xinfeng Hsinchu, Taiwan
2017 Speaker • National Taipei University of Technology, Taipei, Taiwan
2017 Speaker • Daikin - Hotai Development, Taipei, Taiwan
2017 Speaker • Kaison Green Electric Technology Company, Taichung, Taiwan
2018 Co-organizer • Nanotech in Food Production
2020 NSF I-CORPS • IoT Project, School of Engineering Technology, Purdue University
2020 Advisor, Engineering Training and Education Grants, Purdue University
2020 EXTERNAL MENTOR (Services) • Navtat Solutions (Bangalore, India)
2020-2023 Advisor, SARS-CoV-2 Sensors for Detection, NIH RADx RAD, Clemson University
2022 Talk • PEAS: Connecting decision science with analytical electrochemistry, PITTCON
2022 Talk • Frontiers in Chemistry Forum (Berlin, DE)
2022 Talk • ACE2 Sensor for SARS-CoV-2 (SPIE)
2022 Talk • Healthcare, Medical Ethics, Dying and Death • Würzburg, DE www.ukw.de
2022 Invited Lectures • National Cheng Kung University (NCKU), Tainan, Taiwan
2023 Talk • ACE2 Sensor for SARS-CoV-2 (SPIE)
2024 Digital Twins • ICORES Rome - <https://icores.scitevents.org/KeynoteSpeakers.aspx#2>

GRANTS & CONTRACTS

REVIEW PANELS • STEERING COMMITTEE • ADVISORY BOARDS

- 1996-1997 Award → US Department of Commerce, National Telecommunications Information Infrastructure Authority (NTIIA) ▪ \$750,000
Project → Interactive University Program (online university – high school partnership for students/teachers. Sponsor: Carol Christ (Chancellor), University of California, Berkeley)
Collaborators → University of California, Berkeley and San Francisco Public Schools
- 1998-1999 Contract → State of California, Department of Education
Program → State Standards for Mathematics & Science
Associated Scientists (Co-Founders : Shoumen Datta, Glenn Seaborg, Stan Metzenberg)
- 2006-2009 Award – European Union (EU) Commission on Intelligent Systems • FP6 ▪ € 1.2 million
Project – SMART RFID Integration • http://cordis.europa.eu/projects/rcn/80467_en.html
Collaborators – Trinity College, Dublin and MIT Forum for Supply Chain Innovation
- 2014-2015 Steering Committee, Time Aware Applications, Computation and Communication Systems • www.taaccs.org CPS, PWG • National Institute of Standards and Technology
- 2015 US DoT ITS [DTFH6115R00003](https://www.dtfh6115r00003.com/) – [IIC Proposal](#) for Connected Vehicles • <http://bit.ly/IIC-2013-2016-SD>
- 2015 ICE Alliance (www.icealliance.org) • EU IoT 2.0 (<http://www.ict-citypulse.eu>)
- 2016 Advisory Boards • EU-Japan Horizon 2020 project BigClouT • EU – S Korea Horizon 2020 project WiseIoT • EU Horizon 2020 Project - Healthcare Data (SC1-PM-04)
- 2017 IIC LSTB Summary Report - <http://bit.ly/IIC-2013-2016-SD> • <http://bit.ly/IIC-SC-NRT>
IIC Support (LoS) for EU Horizon 2020 proposals (2015-2016) <http://bit.ly/IIC-LoS>
- 2017 US Government Accountability Office and US National Academy of Sciences – Panel on Technology Assessment of IoT requested by US Senate • Technology Assessment – Internet of Things • www.gao.gov/products/GAO-17-75
- 2017 Cybersecurity for Medical Devices • US Department of Homeland Security and FDA (PI - Dr Julian Goldman, MGH, HMS) ▪ \$5.8 million
- 2018-2023 UF SmartPath, NIFA, US Depar of Agriculture [AFRI 2017-08795] ▪ \$5 million
- 2020-2022 SARS-CoV-2 Detection in Saliva using Nano-sensors and Smartphone ▪ \$2 million
NIH Grant 1U01AA029328-01 • <https://doi.org/10.26434/chemrxiv.13102877>

Table: Grants & Funding Management for Industrial Internet Consortium (IIC) Member Corporations

Proposal Related Documentation http://bit.ly/SD-IIC-1-100	Government Agency (submission/preparation)	Funding for <i>includes IIC members</i>	Comments / Information
Autonomous Transportation http://bit.ly/DOT-DOT-DOT	US Dept of Transportation (submitted 3/2015)	\$ 20 million	Did not receive rejection or funding
BigClouT EU-JP http://bit.ly/Project-Brief	EU Horizon 2020 (submitted 12/2015)	€ 3 million	Funding Starts Sep/Oct 2016
WiseIoT EU-SK http://bit.ly/Project-Brief	EU Horizon 2020 (submitted 12/2015)	€ 4 million	Funding Starts Sep/Oct 2016
ACTIV AGE http://bit.ly/Project-Brief	EU Horizon 2020 (submitted 4/2016)	€ 20 million	Funding Starts Sep/Oct 2016
Internet of Food http://bit.ly/Project-Brief	EU Horizon 2020 (submitted 4/2016)	€ 30 million	Funding Starts Sep/Oct 2016
WLIVE Wearables http://bit.ly/Project-Brief	EU Horizon 2020 (submitted 4/2016)	€ 1.3 million	Not funded for FY 2016
LSP Scale-up-IoT http://bit.ly/SCPPP-07	EU Horizon 2020 (submitted 4/2016)	€ 3 million	Not funded for FY 2016
Healthcare Data http://bit.ly/HCPPP-04	EU Horizon 2020 (submitted 4/2016)	€ 6.2 million	Not funded for FY 2016
Healthcare Robotics	EU Horizon 2020 (submitted 4/2016)	€ 1.8 million	Not funded for FY 2016

Global Business Experience and Management of Technology Innovation

Business innovation and catalyzing profitability through strategy and management of technology • Demonstrated expertise in steering organizational change through strategy, management and leadership of multi-national teams

- ☑ Sales and Revenue Growth
- ☑ Channel Management
- ☑ Product Development
- ☑ Commercialization
- ☑ Innovation Index
- ☑ Strategic Planning
- ☑ Change Management
- ☑ Market Assessment
- ☑ Partnerships (PPP)

1999-2002

SAP Labs (Palo Alto, California)

SAP AG (Waldorf, Germany)

\$100 billion (market cap) software corporation for ERP

High Tech Business Unit - SAP Labs Palo Alto, CA

- [a] Development consultant for high tech IBU
- [b] Pre-sales support for semiconductor industry – highest growth vertical included CRM, DRM, PLM, MES
- [c] Global management of liaison with SAP Japan

Revenue Growth estimated at \$1 million +

High Tech Accounts – SAP Japan (Tokyo, Japan)

- [a] Major customers - SONY, HITACHI and MITSUBISHI
- [b] Specifically served as the SAP SCM (APO suite) pre-sales support team for SONY Semiconductors, SONY Electronics, SONY Logistics, SONY Entertainment
- [c] Defined SAP-SONY APO needs for sales strategy
- [d] Major sales growth for SAP Japan
- [e] Consulting Revenue for SAP Labs Palo Alto

Revenue Growth estimated at \$10 million +

SCM Business Unit – SAP AG (Waldorf, Germany)

- [a] Introduced RFID innovation for SAP digital SCM
- [b] RFID SCM partnership with P&G and SONY (Japan)
- [c] Co-created business plan for SAP SCM RFID for integration with emerging digital transformation
- [d] Helped SAP adoption of RFID in multiple verticals
- [e] Represented SAP at RFID Technology Board at MIT
- [f] Inspired SAP to publish at least 2 books on RFID:
 1. *Adapt or Die* (Claus Heinrich and Bob Betts)
 2. *RFID and Beyond* (Claus Heinrich)

Revenue Growth estimated a \$100 million +

2000-2003

MIT Auto ID Center, Member of Technology Board

- ☑ RFID Vision - Real-Time Intelligent Data, IoT
- ☑ Strategic and Business Applications of RFID
- ☑ RFID as a Real-Time Data Tool for Supply Chain
- ☑ RFID next generation applications and evolution
- ☑ RFID Consulting with Wal-Mart, US DoD, P&G, Kimberly-Clark, Tesco, UniLever, Gillette, Deloitte, Accenture, PWC, Hitachi, Philips, GSK, Taiwan

2001-2010

MIT Forum for Supply Chain Innovation, Co-Founder
MIT School of Engineering, Sloan School of Management

1 – Thought leadership for supply chain innovation

2 – Company specific solutions and consulting

- SAP → Revenue Growth estimated at \$10 million +
- Intel → Revenue Growth estimated at \$10 million +
- P&G → Revenue Growth estimated at \$10 million +
- GE → Revenue Growth estimated at \$10 million +
- CapGemini
- Deloitte
- Mitsubishi (Japan)
- Sony (Japan)
- TEPCO (Japan)
- Chi-Mei (Taiwan)
- Volvo (Sweden)
- TCS (India)
- Tata Iron & Steel (India)
- Siam Cement (Bangkok)
- TEKES (Finland)
- Michelin (France)
- Hitachi (USA)
- ITRI & III (Taiwan)

3 – Country specific advising for governments and global organizations

- US Department of Defense (US Army Materiel Command, Fort Belvoir, VA)
- US Department of Homeland Security (US Customs, TSA)
- World Customs Organization (Brussels)
- United Nations - UNDP (New York, Shanghai)
- Government of Finland (Council on Science and Technology - TEKES)
- Government of Taiwan (Ministry of Economic Affairs, Industrial Dev Board)
- Government of Thailand (Ministry of Science and Technology)
- Government of Ireland (Innovation IRL, Office of Taoiseach-Prime Minister)
- Government of India (Ministry of Finance, Bureau of Energy Efficiency)
- GS1 Hong Kong (China)
- President's Science and Technology Advisory Group (Ministry of Home Affairs, Taiwan, ROC)

1999-2002

Global Operations Management

- SAP Labs, Palo Alto, California
 - High Tech Business Unit
 - Software Development Consultant
 - CRM and SCM pre-sales support
 - SCM consulting with SAP Japan
 - SAP internship coordinator
- SAP AG, Waldorf, Germany
 - RFID innovation and university research liaison
 - SCM real-time data leadership with P&G
 - SAP lead at MIT Auto ID Center
 - SCM partnership with Intel and Metro AG
- SAP Japan, Tokyo
 - SCM sales consulting (SONY, MITSUBISHI)
 - SCM pre-sales support and thought leadership
 - SCM presentations
 - SCM public communications

2001-2003

- SCM RFID - MIT Auto ID Center, School of Engineering, Massachusetts Institute of Technology, Cambridge, MA 02139
 - Technology Board
 - RFID Standardization
 - SCM real-time RFID, IoT
 - SAP SCM thought leadership
 - SAP SCM RFID in intelligent planning
 - RFID in public interest communications
 - Intelligent software agents in inventory planning
 - Connecting atoms to bits • networked physical world
- Digital Supply Chain Management, MIT Forum for Supply Chain Innovation, MIT School of Engineering and MIT Sloan School of Management, MIT, Cambridge, Massachusetts

2001-2010

Co-Founder, MIT Forum for Supply Chain Innovation, School of Engineering, MIT (Cambridge, MA 02139)

- Executive Director (2002-2006) and Research Director (2007-2010)
- SCM global thought leadership and major advances in forecasting
- Worldwide consulting – SCM, RFID, Logistics and Intelligent DSS
- Project partnerships for SCM advances, tools and technology
- SCM advising for governments and organizations
 - US Department of Defense (US Army Materiel Command, Fort Belvoir, VA)
 - US Department of Homeland Security
 - World Customs Organization (Brussels)
 - United Nations
 - UNDP (Shanghai, China)
 - Government of Finland (TEKES, Ministry of Science and Technology)
 - Government of Taiwan (Ministry of Economic Affairs, STAG)
 - Government of Thailand (Department of Science and Technology)
 - Government of Ireland (Office of the Prime Minister)
 - Government of India (Ministry of Finance – Customs; Energy)
 - GS1 Hong Kong (China)
 - ITRI & III (Taipei, Taiwan)
- SCM and intelligent data analytics in RFID-SCM decision systems consulting
 - SAP
 - Intel
 - P&G
 - IBM
 - GE
 - CapGemini
 - Deloitte
 - Mitsubishi (Tokyo, Japan)
 - Sony (Tokyo, Japan)
 - TEPCO (Tokyo, Japan)
 - Chi-Mei (Tainan, Taiwan)
 - Volvo (Goteborg, Sweden)
 - Tata Consultancy Services (Mumbai, India)
 - Tata Iron & Steel Co (Jamshedpur, India)
 - Siam Cement Group (Bangkok, Thailand)
- SCM Innovation, Strategy & Management – Executive Education & SCM MBA Courses
 - MIT Sloan School of Management (Cambridge, Massachusetts)
 - Haas School of Business, University of California (Berkeley, California)
 - Chalmers University of Technology (Goteborg, Sweden)
 - Ecole Supérieure des Sciences Economiques et Commerciales (Paris, France)
 - Institut Supérieur de Logistique Industrielle, BEM (Bordeaux, France) KEDGE BS
 - National Taiwan University (Taipei, Taiwan)
 - National Cheng Kung University (Tainan, Taiwan)
 - Indian Institute of Management (Ahmedabad, India)
 - Trinity College (Dublin, Ireland)
 - University College Dublin (Dublin, Ireland)
 - University of Cambridge (Cambridge, UK)
 - Helsinki University of Technology (Helsinki, Finland)
 - Lappeenranta University of Technology (Lappeenranta, Finland)
 - University of Iceland (Reykjavik, Iceland)
 - Indian Institute of Management (Ahmedabad, India)

Analyst / Advisory – Disclosure of topics, statement of work & agreements are prohibited (NDA compliance)

IBM	Digital Value Networks
GE	Industrial IoT • RFID, UWB, Sensors • Predictive Analytics • Digital Supply Chain • IPv6
P&G	Transparency of SCM • Design of Data Flow • RFID in Supply Demand Network • Agents in SCM
Koch	Digital Transformation • IoT and Industrial IoT Data, AI, Analytics • Sensors, robotics, nanotech
PepsiCo	Supply Chain Management (SCM)
Xerox	Intelligent PLM (product life cycle management)
Intel	RFID and digital SCM in retail stores of the future • Autonomous Transportation • Industrial IoT
Volvo	Intelligent Decision Systems
Tata (Tata Steel)	Supply Chain Planning and Optimization
Siam Cement	Supply Chain Planning and Optimization • Energy Efficiency • Sensor Networks • Asset Management
Michelin	Inventory Optimization • Operations Management • RFID in Asset Management
Hitachi	RFID in track and trace • IoT and the industrial internet • Digital Transformation • Transportation
Airbus	RFID in track and trace • Spare parts inventory management
General Motors	RFID in track and trace • Spare parts inventory management
AAR	RFID in track and trace • SCM inventory management • Digital Transformation • Data, Analytics, AI
Kone	Intelligent PLM (product life cycle management) and coupling with digital supply chain management
Nokia	Intelligent PLM (product life cycle management) and coupling with digital supply chain management
Chi-Mei	Digital interfaces in healthcare infrastructure
LogicaCMG	SCM and the evolution of value networks
CapGemini	RFID and digital supply chain • IoT
Sony	RFID in semiconductor industry transparency • Global Logistics • SCM software • Decision Systems
Mitsubishi	RFID in heavy industry
TEPCO	Internet infrastructure • IPv6 • Semantic Interoperability between systems • Intelligent Systems
Huawei	IoT and Industrial IoT • Digital Transformation • Data, Analytics, AI and Intelligent Decision Systems
TCS	Data and Artificial Intelligence • Digital Transformation • Robotics and Automation
Fujitsu	IoT and Industrial Internet • Data, Analytics and AI
TechMahindra	IoT and Industrial Internet • Data, Analytics, AI • Medical Devices • Interoperability • Cybersecurity
Accenture	IoT and Industrial Internet • Data, Analytics and AI • Digital Twins • Digital Transformation of SCM
Deloitte	Healthcare Information Technology (HIT)
Braun	Medical Devices • Interoperability • Cybersecurity
Infosys	IoT and Industrial Internet • Data, Analytics, AI • Autonomous Transportation

Governments	
AOK (DE)	Digital Transformation in Healthcare • Cybersecurity • Data, Analytics, AI
WCO (EU)	Security and Cybersecurity in multi-modal transportation • Standards for security harmonization
DHS (US)	Risk in security • ACE Program
ITRI (TW)	IoT and Industrial Internet • SCM • Sensors and energy efficiency
III (TW)	RFID, IoT, IIoT • Digital SCM • Data, Analytics, AI • Cybersecurity • Blockchain • Transport
MOEA (TW)	IoT and Industrial Internet • Digital SCM • Data, Analytics, AI • Education Technology
STAG (TW)	RFID and Digital SCM
TEKES (FI)	Ministry of Science and Technology (Innovation, SCM, PLM, Data, Analytics, IoT, Cybersecurity)
Ireland	Prime Minister's Task Force for Innovation (Energy)
India	Customs Bureau, Ministry of Finance
DoD (US)	US Army Materiel Command
GAO, NAS (US)	Cybersecurity • IoT and Industrial IoT
DoC (US)	Workforce and Education for Economic Growth (National Task Force for Clinton Administration)
State of California	Special Assistant to Mayor of San Francisco for Public K-12 Education (SFUSD) http://bit.ly/SD-K12

1980-1994

Molecular Biology • Biochemistry • Protein Chemistry • Genetics • Biotech • Microbiology • Virology • Cell Bio

☑ UNIVERSITY OF CALIFORNIA, SAN FRANCISCO • UCSF SCHOOL OF MEDICINE
INSTRUCTOR MD PROGRAM • MEDICAL GENETICS

☑ UNIVERSITY OF CALIFORNIA, SAN FRANCISCO • UCSF SCHOOL OF MEDICINE
RESEARCH SCIENTIST • MOLECULAR PARASITOLOGY • INFECTIOUS DISEASES

Unpublished work represents an attempt to study RNA Polymerase specificity of transcription in the parasite *Trypanosoma brucei* which is known to cause Trypanosomiasis (also referred to as sleeping sickness). *T. brucei* cell-free extracts were prepared and transcriptional analyses were performed with RNA Pol I, RNA Pol II and RNA Pol III promoters from parasite, human and DNA virus. Functional *in vitro* transcription systems generated transcripts which suggested that RNA polymerase from *T. brucei* was likely to be less specific in its choice of promoters for initiation of transcription. Use of known transcription inhibitors had a range of concentration dependent effects which suggests that the RNA polymerase in *T. brucei* may use related but different mechanism(s) of action to initiate transcription from promoters.

☑ MASSACHUSETTS INSTITUTE OF TECHNOLOGY • MIT HUMAN GENOME PROJECT •
WHITEHEAD INSTITUTE
RESEARCH SCIENTIST • MOLECULAR BIOLOGY OF TRANSCRIPTION • YEAST ARTIFICIAL CHROMOSOMES (YAC)

Unpublished work represents a successful attempt to reconstitute bonafide RNA Polymerase II initiation of transcription *in vitro* using protein complexes of purified transcription factors fractionated from cell free extracts of *Saccharomyces cerevisiae* (yeast). Reconstitution mapped the order of association and sequence of transcription factor complex formation for initiation and elongation of transcription for RNA Polymerase II promoter. Unpublished work from the Human Genome Project (1994) was focused on optimization on packaging of increasingly large pieces of human genomic DNA (>10 MB) in yeast artificial chromosomes and successful transformation to generate viable yeast cells with these YACs.

☑ HARVARD MEDICAL SCHOOL • HARVARD UNIVERSITY
INSTRUCTOR IN MOLECULAR MEDICINE, PHYSIOLOGY & METABOLISM

☑ HARVARD MEDICAL SCHOOL • HARVARD UNIVERSITY • MASSACHUSETTS GENERAL
HOSPITAL
RESEARCH FELLOW IN MEDICINE • MOLECULAR ENDOCRINOLOGY • THYROID AND NEURO-ENDOCRINE LAB

Published work which unraveled and identified the molecular mechanisms of the DNA-protein interactions responsible for the initiation of transcription which in turn regulated the steroid or thyroid hormone dependent or independent gene expression profile of the thyroid receptor genes in normal human subjects and in patients with thyroid hormone resistance syndrome or thyroid carcinoma (cancer). Taken together, this work helped to elucidate the clinical anomalies and enabled clinical improvements in the treatment of thyroid dysfunction.

☑ RUTGERS • UMDNJ • NEW JERSEY MEDICAL SCHOOL • GRADUATE SCHOOL OF
BIOMEDICAL SCIENCES
PhD • MOLECULAR BIOLOGY • BIOCHEMISTRY • MICROBIOLOGY • VIROLOGY

Published and unpublished research pursued for PhD thesis focused on molecular differentiation of the mechanism of actions by which cancer inducing proteins from DNA tumor viruses influence the rate of cellular gene expression from RNA Pol I, RNA Pol II and RNA Pol III promoters and enhancers in cell free extracts (*in vitro* transcriptional analysis in extracts prepared from HeLa cells). The Adenovirus oncogene E1A was bio-engineered to create a series of overlapping mutants in order to map the active sites of protein-protein or protein-DNA interactions *in vivo* (in the yeast two-hybrid system) and *in vitro* initiation of transcription. Synthetic peptides were generated to represent the minimum segment of the E1A protein (identified by mutational analysis) which could successfully alter (stimulate or inhibit) gene expression from RNA Polymerase promoters in *in vitro* transcriptional analysis (collaboration with Dept of Molecular Biology, Princeton U).

☑ UNIVERSITY OF PITTSBURGH
CELLULAR & MOLECULAR BIOLOGY • BIOCHEMISTRY • GENETICS • MICROBIOLOGY • VIROLOGY

Unpublished work [1] creating monoclonal antibodies in cell culture. [2] Genetic and DNA sequencing analysis of mutations induced in the cloned large T antigen (oncogene) of the SV40 DNA tumor virus using cell culture assay to detect tumor inducing effect (*in vitro* cell culture). Truncated versions of large T antigen were tested to map and differentiate steps in the progression of the induction of tumor in cell culture. [3] Translational control of protein synthesis in bacteria which identified various types of small RNAs in the translation complex with proteins which could have interfered with the translation of the mRNA in the bacteria. Characterization of the small interfering RNAs were incomplete.

1990-1994

Public Education • Technology • K-12 Outreach • Harvard Medical School • Massachusetts Institute of Technology • Boston Latin School

Activities were undertaken while I was a Research Fellow in Medicine at Massachusetts General Hospital, Harvard Medical School & Research Associate at Whitehead Institute, Massachusetts Institute of Technology.

- ☑ Research host for middle school student internship from public schools in Dorchester and Roxbury
- ☑ Created partnership programs between middle school and Harvard Medical School K-12 outreach
- ☑ Research guide for high school students from Boston Public Schools
- ☑ Helped in the formation of Teacher's Program at the Whitehead Institute, MIT
- ☑ Secured multi-year funding for Boston Latin School from Edwin Rowland Foundation
- ☑ Focused my personal efforts on Boston Latin School to improvement science laboratories
- ☑ Created a program to inspire students by organizing talks by Nobel Prize winners (13 participated)

1996-1999

Public Service • K-12 • Special Assistant to SFUSD • California Mathematics & Science Standards • National Taskforce for Workforce Development

☑ Helped plan Thurgood Marshall Academic High School with mandatory graduation requirements in language, science and mathematics. An instructional success at this school was the cover story of US News & World Report [2 Dec 1996] and this pre-engineering program segued to evolve as the first hands-on Cisco Networking Academy. www.theatlantic.com/issues/97jul/computer.htm and www.cnn.com/TECH/computing/9902/25/schoolwork.idg/

☑ Instituted mentorship and internship program for students as well as teachers with help from Carol Christ, Vice-Chancellor of UC Berkeley and Condoleeza Rice, Provost of Stanford University. Recruited highly qualified teachers in language arts, mathematics, science and technology to uphold academic excellence. Secured funding from Silicon Graphics to supplement teacher salaries in cooperation with the SF teacher's union.

☑ Professional development partnership to enable teachers to take courses for credit at UC Berkeley at no cost to teacher or SFUSD. Josephine Miles Fellowship funded and sponsored by Carol Christ, Vice-Chancellor, UC Berkeley. Collaboration catalyzed by Charles Townes, Professor of Physics, UC Berkeley.

News: <https://www.sfgate.com/news/article/PAGE-ONE-UC-Berkeley-Is-Taking-The-Pledge-3017592.php>
<https://www.sfgate.com/opinion/article/EDITORIAL-Tien-s-Alternative-To-Affirmative-2999656.php>
http://articles.sfgate.com/1996-01-02/opinion/17765856_1_berkeley-pledge-uc-berkeley-regents-decision

☑ Partnership with Pacific Bell to upgrade network infrastructure (\$2.5 million) to enable Clinton-Gore Net Day 1996 and introduce internet in the classroom. Detwiler Foundation donated 1000 computers for students to take home as a part of a collaboration for the school district computer literacy program for students and parents. NASA donated several hundred computers and other scientific equipment for school laboratories (NASA Moffett Field) including an electron microscope (at Philip and Sala Burton High School, San Francisco Unified School District, San Francisco, California).

- ☑ Established joint venture with UC Berkeley Interactive University Program to benefit students and teachers from UC Berkeley resources that could be accessed remotely and UC students to provide real-time online tutoring to school students (point-to-point systems using remote webcam). Received NTIA-TIIAP grant award (\$650,000) from US Department of Commerce for public school technology innovation in collaboration with the Interactive University Program at UC Berkeley (online education technology).
- ☑ Worked with UC Berkeley Chancellor Chang Lin Tien and then Vice Chancellor Carol Christ to shape Berkeley Pledge activities to help Bay Area students (SFUSD) gain broader access to advanced academic opportunities, inspiration and vision. Catalyzed by Glenn Seaborg, Emeritus Director, Lawrence Berkeley Lab.
- ☑ Nominated by US Department of Commerce and Information Technology Association of America to Chair the National Task Force on Mathematics and Science Education and its Impact on Workforce Development. 1997 National Information Technology Convocation sponsored by the US Department of Commerce and White House Council of Economic Advisors. Strategic planning and economic impact of IT workforce. Convened at UC.
- ☑ Formed **ASSOCIATED SCIENTISTS** (co-founded with Glenn Seaborg and Stan Metzenberg) which was catalytic in changing the K-12 mathematics and science standards for State of California. These standards received a perfect score from the American Federation of Teachers [AFT] in their 1998 report **Making Standards Matter**. Review ASSOCIATED SCIENTISTS in Seaborg, Glenn T (2001) *Adventures in The Atomic Age*, pages 293-294 (ISBN 0-374-29991-9) and Seaborg, Glenn (Archives) Library of Congress **Box 276** <http://hdl.loc.gov/loc/mss/eadmss.ms006039>

ARTICLES RELATED TO PUBLIC EDUCATION ▪ <http://shoumendatta.wordpress.com/>

Datta, S. (2022) *A Nation in Progress*. (working paper) <https://dspace.mit.edu/handle/1721.1/146640>

Datta, S. (2010) *Entrepreneurial Innovation* <https://dspace.mit.edu/handle/1721.1/54837>

Waltar AE, Beaumont P, Earl B, Peddicord KL, **Datta S.** 1999. What The Public Wants to Know. Proceedings of the American Nuclear Society. Long Beach, CA.

Datta, S. (1998) National Task Force (US) Report. US Dept of Commerce & ITAA, Washington, DC

Datta, S. (1998) Community Colleges as Catalysts for Economic Growth through IT Centers

Datta, S. (1997) Integrated Network for Education [Education Commission, US Senate, 1999]

Datta, S. (1997) Science Education and Economic Growth

Datta, S. (1997) Public Education [Interview]

Datta, S. (1996) Good Teaching [Letter] *Science* **271** 1789

Datta, S. (1996) Retrofit Public Education: Science and Technology Education Partnership for Schools

Datta, S. (1996) Standards: The Widening Gulf Between Concepts and Implementation

Datta, S. (1995) Partnership for International Public Health: Molecular Diagnostics and Public Issues

Datta, S. (1995) Art and Education: Value of Public Museums to Science Education

Datta, S. (1995) Interactive Mathematics: Experimental Concept Gone Awry

NIH (National Institute of Health) BIO-SKETCH

eRA COMMONS USER NAME (credential, e.g., agency login): Datta, Shoumen Palit Austin

POSITION TITLE: Research Administration

INSTITUTION AND LOCATION	DEGREE	COMPLETION	FIELD OF STUDY
Presidency College, University of Calcutta, India	B.Sc.	08/1980	Biochemistry and Physiology (Physics and Chemistry)
Rutgers University School of Medicine, New Jersey, USA	Ph.D.	07/1989	Molecular Biology, Microbiology & Virology
Harvard Medical School, Massachusetts General Hospital, Boston, Massachusetts, USA	Fellow in Medicine	06/1991	Molecular Medicine: Thyroid and Neuro-Endocrinology, Molecular Oncology
Massachusetts Institute of Technology, Whitehead Institute, Cambridge, Massachusetts	Postdoctoral Associate	11/1994	Molecular Biology and Human Genome Project
University of California San Francisco (UCSF), CA	Research Associate	12/1995	Molecular Parasitology and Infectious Diseases

A. Personal Statement

My background includes basic science, biomedical sciences, molecular biology and medicine, in addition to bit of engineering and commerce. Scientific training includes [I] human genome project (DNA sequencing, creating yeast artificial chromosomes), [II] transcriptional regulation and genetics [1] regulation of gene expression by DNA tumor virus oncogenes, {2} yeast genetics for transcription factor analysis in vivo, {3} in vitro reconstitution of transcription initiation complex, {4} protein chemistry of eukaryotic transcription factors, {5} recombinant protein expression in and purification from baculovirus, {6} regulation of thyroid hormone receptor gene expression in patients with thyroid carcinoma, {7} glucocorticoid and steroid receptor gene expression in pituitary carcinoma, {8} molecular parasitology of infectious diseases using parasite *Trypanosoma brucei*. I have also used my (A) basic science fundamentals to build bridges into engineering domains (radio frequency, data and decisions, networks, systems, operations and industrial management) and (B) communication skills in {i} administration of public science education {ii} workforce development issues in state and federal government and {iii} advising corporations and friendly foreign governments (Finland, Ireland, Taiwan, to name a few).

My penchant for science and research, as a lifelong purpose, is unchanged but strengthened by my collective experience in science, medicine, engineering, commerce and government or wherever the convergence of knowledge, communication and administration was/is necessary as a part of the mission. My lack of overt greed for personal wealth creation, my ability to perform as a relatively unbiased science and engineering observer and my ability to view issues as a “global” citizen with a moderate sense of the future, are reasons for my involvement with consortiums involving global academia, industry and governments, on a range of topics such as standardization of radio frequency identification, internet of things and industrial internet, data and semantics, operations and supply change management. The confluence of ideas in the proposed research seeks trans-disciplinary convergence to create end-to-end systems that I have discussed, in principle, in my publications, and exemplified in practice as a member of the hospital medical device community where the problems of data and failure of data interoperability in decision systems are contributing to fatal mistakes (which makes the latter the [third leading cause of death in the US](#)). During 2008-2009 my life was gravely disrupted by colon cancer. After a few years of convalescence, I resumed my activities with encouragement from friends ([Sanjay Sarma](#), [Joe Salvo](#)) and re-started advising in science, technology and engineering as well as teaching (operations management, supply chain, decision systems, innovation, entrepreneurship). I also re-engaged in research publications with erudite collaborators ([Eric Scott McLamore](#)) to further my professional horizon and enabling the tools of science to better serve society.

<https://bit.ly/Google-Scholar-SD>

Selected Publications in Support of Personal Statement

01. Datta, S. (2020) Porous Pareto Partitions in ‘*Advances in Measurements and Instrumentation: Reviews*’, Vol. 2, Book Series, IFSA Publishing, Barcelona, Spain (*in press*). “P3” from MIT Libraries - <https://dspace.mit.edu/handle/1721.1/123984>
02. Victoria Morgan, Lisseth Casso-Hartman, David Bahamon-Pinzon, Kelli McCourt, Robert G. Hjort, Sahar Bahramzadeh, Irene Velez-Torres, Eric McLamore, Carmen Gomes, Evangelyn C. Alocilja, Shoumen Palit Austin Datta and Diana C. Vanegas (2019) *Sensor-as-a-Service: Convergence of Sensor Analytic Point Solutions (SNAPS) and Pay-A-Penny-Per-Use (PAPPU) Paradigm as a Catalyst for Democratization of Healthcare in Underserved Communities*. *Diagnostics* 2020, 10 (1), 22 <https://doi.org/10.3390/diagnostics10010022> “SNAPS TRILOGY” MIT Libraries <https://dspace.mit.edu/handle/1721.1/123983>
03. Eric S. McLamore, R. Huffaker, Matthew Shupler, Katelyn Ward, Shoumen Palit Austin Datta, M. Katherine Banks, Giorgio Casaburi, Joany Babilonia, Jamie S. Foster (2019) Digital Proxy of a Bio-Reactor (DIYBOT) Combines Sensor Data and Data Analytics for Wastewater Treatment and Wastewater Management Systems. *Nature Science Reports* 10, 8015 (2020). <https://doi.org/10.1038/s41598-020-64789-5> ◆ PDF from MIT Libraries <https://dspace.mit.edu/handle/1721.1/123983>
04. McLamore, E.S., S.P.A. Datta, V. Morgan, N. Cavallaro, G. Kiker, D.M. Jenkins, Y. Rong, C. Gomes, J. Claussen, D. Vanegas, E.C. Alocilja (2019) SNAPS: Sensor Analytics Point Solutions for Detection and Decision Support. *Sensors*, vol. 19, no. 22, November 2019, p. 4935 ◆ www.mdpi.com/1424-8220/19/22/4935/pdf ◆ <https://dspace.mit.edu/handle/1721.1/123983>
05. Y. Rong, A.V. Padrona, K. J. Hagerty, N. Nelson, S. Chic, N. O. Keyhani, J. Katz, S.P.A. Datta, C. Gomes, and E.S. McLamore (2018) Post Hoc Support Vector Machine Learning for Impedimetric Biosensors Based on Weak Protein–Ligand Interactions. *The Analyst*, vol. 143, no. 9, 2018, pp. 2066–2075 doi:10.1039/C8AN00065D <https://pubs.rsc.org/en/content/getauthorversionpdf/C8AN00065D>
06. Datta, S. (2017) *Haphazard Reality – IoT is a Metaphor* • MIT Libraries - <https://dspace.mit.edu/handle/1721.1/111021>
07. Datta, S. and Goldman, J.M. (2017) Healthcare - Digital Transformation of the Healthcare Value Chain: Emergence of Medical Internet of Things (MIoT) may need an Integrated Clinical Environment, ICE (World Health Strategy e-book • www.fhti.org) Listed as (pdf) “Healthcare” - MIT Libraries - <https://dspace.mit.edu/handle/1721.1/107893>
08. Datta, S. *et al* (2017) Technology Assessment – Internet of Things ▪ www.gao.gov/products/GAO-17-75
09. Datta, S. (2015) L’Internet des Objets : la troisième révolution industrielle. *Logistique and Management* 23 n°3 29-33 DOI: 10.1080/12507970.2015.11742760 • <http://www.tandfonline.com/doi/abs/10.1080/12507970.2015.11742760>
10. Datta, S. (2011) Future of Healthcare: Bio-Informatics, Nano-Sensors and Emerging Innovations (Chapter 8 in *Nanosensors: Theory and Applications in Industry, Healthcare & Defense* ed TC Lim) CRC Press <http://dspace.mit.edu/handle/1721.1/58972> <http://www.crcpress.com/product/isbn/9781439807361> and <http://esd.mit.edu/WPS/2008/esd-wp-2008-17.pdf>
11. Datta, S., Graham, D.P., Sagar, N., Doody, P., Slone, R. and Hilmola, O-P. (2009) Forecasting and Risk Analysis Supply Chain Management: GARCH Proof of Concept (Chapter 10 in *Supply Chain Risk and Vulnerability: Tools and Methods for Supply Chain Decision Makers* editors Wu, T. and Blackhurst, J.) Springer-Verlag <http://dspace.mit.edu/handle/1721.1/43948>
12. Datta, S. (2007) Unified Theory of Relativistic Identification of Information in a Systems Age: Proposed Convergence of Unique Identification with Syntax and Semantics through Internet Protocol version 6 (ESD-WP-2007-17) *International Journal of Advanced Logistics* 1 66-82 MIT ESD <http://dspace.mit.edu/handle/1721.1/41902>
13. Datta, S. (2007) Advances in Supply Chain Management: Potential to Improve Forecasting (ESD-WP-2006-11)
14. Datta, S., Granger, C. W. J., Barari, M. and Gibbs, T. (2007) Management of Supply Chain: an alternative modeling technique for forecasting. *Journal of the Operational Research Society* 58 1459-1469 <http://dspace.mit.edu/handle/1721.1/41906> Online published version <http://www.tandfonline.com/doi/full/10.1057/palgrave.jors.2602419>
15. Datta, S. (2006) Advances in Supply Chain Management Decision Support Systems: Potential for Improving Decision Support Catalyzed by Semantic Interoperability between Systems (ESD-WP-2006-10) <http://dspace.mit.edu/handle/1721.1/41906>
16. Datta, S., and Granger, C. W. J. (2006) *Improvements in Forecasting*. MIT Engineering Systems Division Working Paper on Econometrics in Operations Research and Supply Chain Management <https://dspace.mit.edu/handle/1721.1/102799>

17. Datta, S. (2006) Charlie's Skypeout Strategy (TEKES Report, Govt of Finland)
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B. Positions

1999-present (with breaks)

Research Affiliate, Auto ID Labs, Dept of Mechanical Engineering, MIT ▪ <https://autoid.mit.edu/shoumen-datta>

2000-2010

Research Scientist, Engineering Systems Division, Dept of Civil and Environmental Engineering • Co-Founder and Director, MIT Forum for Supply Chain Innovation, School of Engineering, Massachusetts Institute of Technology

2014-present

Senior Scientist, MDPnP Lab ▪ <http://mdpnp.mgh.harvard.edu> ▪ Massachusetts General Hospital, Harvard Medical School

2015-2020

NSF Center on Robots and Sensors for Human Well Being (RoSeHuB), School of Engineering Technology, Purdue Polytechnic, Purdue University ▪ <https://www.purdue.edu/rosehub/RoSeHUB.contact.html>

2018-present

Research Coordinator III, Center of Excellence, IFAS, UF ▪ <https://emclamor.wixsite.com/mclamorelab>

1999-present (with breaks)

Research Affiliate, Auto ID Labs, Dept of Mechanical Engineering, MIT ▪ <https://autoid.mit.edu/shoumen-datta>

1999 - 2002

Software Solutions, Global Strategic Innovation, Initiatives, SCM Management ▪ SAP Labs (Palo Alto), SAP German, SAP Japan

1995-1997 Special Assistant [Title XIV], Superintendent of Schools, City and County of San Francisco, San Francisco, California

1994-1995 Research Scientist, University of California at Berkeley and UCSF School of Medicine (San Francisco, California)

UCSF-UC Berkeley Program in Molecular Parasitology & Infectious Diseases • Instructor in Human Genetics UCSF School of Medicine

1991-1994 Research Associate, Whitehead Institute, Massachusetts Institute of Technology (MIT), Cambridge, MA

1990-1993 Instructor in Medicine (Biochemistry and Metabolism), Harvard Medical School, Boston, Massachusetts

1989-1991 Research Fellow, Harvard University • Research Fellow in Medicine, Massachusetts General Hospital

Professional Experiences

1999-2004 MIT Auto ID Center, Founding Member, Technology Board • IoT (Internet of Things) & RFID (radio frequency id)

2001-2010 MIT Forum for Supply Chain Innovation (Co-Founder, Executive Director, Research Director) • Digital Supply Chain

2002-2007 MIT Sloan School of Management, Executive Ed in Strategy and Management, Supply Chain, Sloan Fellows, LMP

2003-2006 MIT Data Center (Co-Founder) Semantics & Data

http://web.mit.edu/edmund_w/www/DATACENTERpeople.htm

2004-2007 Member of IIIS, Trinity College, Dublin

2006-2009 Co-Founder, Center for Integration of Data and Systems (CIDS), Institute of Technology, Tralee, Ireland

2013-2016 IoT in industry sponsored organization (Industrial Internet Consortium, Founding Senior Vice President)

Public Service

2005-2007 Member of the Science and Technology Advisory Group (STAG), Office of the President of Taiwan, Government of Taiwan

2005-2006 Advisor to Secretary General, World Customs Organization, Brussels (<http://www.wcoomd.org/>)

1998-1999 Office of Public Understanding of Science & Advisory Council (Eagle Alliance) Dept of Nuclear Eng, Texas A&M Uni

1997-1998 Visiting Fellow, Cisco Systems, San Jose, CA (creating and promoting the global roll out of Cisco Networking Academy)

1997-1998 Chairman, National Information Technology Task Force. US Departments of Commerce; Labor; Education; White House Council of Economic Advisors and Information Technology Association of America.

(Host: University of California, Berkeley, CA)

1996-1999 President/Co-Founder, Associated Scientists (Co-Founders Glenn Seaborg, UC Berkeley & Stan Metzenberg, CSUN)

C. Contribution to Science (Basic Science Research)

1. My journey in molecular biology began in 1980 and started with sequencing SV40 mutants (by hand, using Allan Maxam and [Walter Gilbert](#)'s handwritten notes on how to optimize piperidine cleavage), using Hind II/III restriction endonucleases which were "made by hand" by [Ham Smith](#) and mailed to us (University of Pittsburgh, 1981) by a post-doc in [Dan Nathans](#) lab (JHU). The large T-antigen occupied most of the 5243 base pairs of this DNA tumor virus but it had too many secrets (we did not know in 1981 and [Marilyn Kozak](#) agreed) that resisted my attempts (1981-1983) to dissect T antigen in order to map structure with function, *in vivo*.
2. In 1980, a paper was published ([Phil Sharp](#)'s lab; co-author [Andy Fire](#)) demonstrating cell-free extracts for transcription *in vitro* (www.pnas.org/content/pnas/77/7/3855.full.pdf). Next, Andy Fire showed (1981) that Adenovirus promoters could initiate transcription by RNA polymerase II *in vitro* (www.ncbi.nlm.nih.gov/pmc/articles/PMC256682/pdf/jvirol00165-0089.pdf). My work, circa 1985 (Rutgers University in collaboration with [S. Jane Flint](#) and [Tom Shenk](#) at Princeton University), focused on the mechanism of action of onco-proteins by which they regulate expression of oncogenes (viral and cellular). By now it was clear that the large Adenovirus E1A protein was the principal player (onco-protein). I proceeded to isolate and purify recombinant 289R E1A and then using Andy's *in vitro* cell extract system, I was able to show that the purified Adenovirus oncoprotein 289R E1A could activate promoters and repress enhancers to regulate gene expression *in vitro*. I presented the combined results ([Nikki Harter's lab](#)) in a "talk" (yes, talk, not a poster) at the Tumor Virus Meeting in 1987 organized by ICRF at Churchill College, University of Cambridge. After a vigorous Q&A following the talk, I walked out of the hall and there was Mike Fried, who stopped me and used superlatives to convey his appreciation of the science and my presentation (Mike Fried in chapter 2 <http://blueskiesbenchspace.org/index.php?pag=2>). It was the first time (?) that the *in vitro* system was capable of showing repression of transcription by an onco-protein (which was the contribution I made to extend the previous work of the lab <https://science.sciencemag.org/content/237/4818/1044>). With S. Jane Flint at Princeton University, I was able to show that the activation and repression by 289R E1A was located to a small 49 amino acid residue (49R synthetic peptide). Is it displacing a cellular factor (<https://www.jbc.org/content/263/8/3984.full.pdf>) which may bind to the enhancer region? The *in vitro* dissection of mechanism of action of proteins and deconstruction of the RNA Polymerase II initiation complex (transcriptional reconstitution) occupied the next few years of my life (Harvard, MIT, UCSF School of Medicine).
32. Datta S, Wang DM, McGrath M, Westerdahl C, Harter ML. Bacterially produced E1A 289R activates Pol III transcription through TFIIC. Imperial Cancer Research Fund (ICRF) Tumor Virus Meeting, 1989. Churchill College, University of Cambridge, UK.
33. Datta, S. (1989) Transcriptional Activities of the 289 amino acid Adenovirus 2 E1A Protein in vitro (PhD thesis) Rutgers University School of Medicine, UMDNJ Graduate School of Biomedical Sciences, Rutgers University, New Jersey, USA
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3. In hypothyroidism and post-surgical treatment of thyroid carcinoma, there appeared to be a disconnect in the responsiveness to tri-iodo-thyronine (T3 therapy) in some patients. Part of the answer to this thyroid hormone resistance syndrome was elucidated by my work during 1989-1991 (with [J. Larry Jameson](#) at MGH, HMS, in the same endocrine unit as [Anne Klibanski](#)). We concluded single nucleotide polymorphisms (SNPs) may alter the DNA sequence of the thyroid response element (TRE) which also overlapped the TFIID binding site for initiation of transcription of the thyroid hormone receptor protein (THR). I was able to demonstrate this effect in *in vitro* transcription in HeLa cell extracts by adding thyroid hormone receptor protein (THR) produced in insect cells infected with recombinant baculovirus vector containing human THR. Addition of thyroid hormone (T3) regulated the effect of the binding of THR to the TRE. We also showed that this mechanism was not a special case for THR but applicable to glucocorticoid and steroid receptors in humans. The "novelty" of this *in vitro* finding was initially snubbed by *the-then* experts ([Bob Roeder](#), [Keith Yamamoto](#)) but later both experts and others were able to replicate and extend our first observations. The treatment regimen for some patients at MGH was changed as a result of this observation. T3 therapy alone could no longer alleviate their symptoms because no matter how much T3 is in the system and irrespective of the binding of T3 with its receptor (THR),

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the T3-THR complex may not bind to the TRE and fail to control the anticipated gene expression. In another scenario, the lack of THR will make addition of T3 ineffective. Relevant publications mentioned in this bio-sketch (with respect to this discussion) are number 23 and numbers 25-31.

4. In 1991, I moved from MGH,HMS to [Richard Young's lab](#) the Whitehead Institute at MIT, where (in collaboration with [Phil Sharp's group](#)) I began purifying all the core RNA Polymerase II transcription factors (TFIIA, TFIIB, TFIIC, TFIIID, TFIIE, TFIIIF) from yeast using protein purification and re-purification. I was able to show transcription initiation by RNA Polymerase II in vitro by sequential addition of TF's. This work was neither recognized nor published because I had a family disaster (accidental death) and by the time I returned to the lab (several months) the lead we had was lost and my work. It was advantage [Roger Kornberg](#).
5. Still at MIT, I joined [Eric Lander](#) (1993) who was setting up the first human genome sequencing project (inaugurated 7/27/1993). I contributed by improving human DNA packaging in YACs (yeast artificial chromosomes). The rest is history and I am a part of it.
6. December 1994, I moved to UCSF School of Medicine. I was able to create an *in vitro* system for studying gene expression in the parasite *Trypanosoma brucei* and showed that transcription of T. brucei promoters were catalyzed by RNA Polymerase III (not RNA Polymerase II as in humans and other eukaryotes). This result was not published because it was preliminary.
7. Inspired by [Bruce Alberts](#), in January 1996, I found myself as an Assistant to the Mayor for the City and County of San Francisco and in charge of bringing [science education](#) to public schools (www.SFUSD.edu). That contribution to science is in a different vein. It was due to [Glenn Seaborg](#). I had help from [Charles Townes](#) and [Richard Zare](#), amongst many others, but a large part of it could not have happened (1996-98) without [Carol Christ](#).

List of Published Work in MyBibliography:

<https://www.ncbi.nlm.nih.gov/myncbi/1JQE6jfmmeekiq/bibliography/public/>
<https://bit.ly/Google-Scholar-SD>

D. Additional Information:

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Research Support and/or Scholastic Performance
Ongoing Research Support

Research Coordinator for SmartPath: USDA-NIFA-AFRI-006304 (PI) Eric McLamore
<https://emclamor.wixsite.com/mclamorelab> and <https://bit.ly/Google-Scholar-SD>

Research Advisor (2020-2022) SARS-CoV-2 Detection in Saliva using Nano-sensors and Smartphone ▪ NIH Grant 1U01AA029328-01 (RFA-OD-20-014)

Original pre-prints <https://doi.org/10.26434/chemrxiv.13102877> & <https://dspace.mit.edu/handle/1721.1/128017>

1-page NSF formatted (National Science Foundation) mini bio-sketch: Dr Shoumen Datta

Professional Preparation

Rutgers University, NJ	School of Medicine	Ph.D., 1990
University of Pittsburgh, PA	Molecular Biology	M.S., 1985
Presidency College, India	Biochemistry	B.Sc., 1980

Recent Appointments

1999-present	Research Affiliate	MIT Auto-ID Center, MIT, Cambridge, MA
2014-present	Senior Scientist	MGH, Harvard Medical School, Cambridge, MA
2001-2010	Executive Director	MIT Forum for Supply Chain, MIT, Cambridge, MA
2013-2016	Senior Vice President	Industrial Internet Consortium

Publications, closely related

1. Y. Rong, A.V. Padrona, K. J. Hagerty, N. Nelson, S. Chic, N. O. Keyhani, J. Katz, S.P.A. Datta, C. Gomesh, and E.S. McLamore (2018) Post Hoc Support Vector Machine Learning for Impedimetric Biosensors Based on Weak Protein-Ligand Interactions. *The Analyst*, vol. 143, no. 9, 2018, pp. 2066–2075 doi:10.1039/C8AN00065D <https://pubs.rsc.org/en/content/getauthorversionpdf/C8AN00065D>
2. McLamore, E.S., S.P.A. Datta, V. Morgan, N. Cavallaro, G. Kiker, D.M. Jenkins, Y. Rong, C. Gomes, J. Claussen, D. Vanegas, E.C. Alocilja (2019) SNAPS: Sensor Analytics Point Solutions for Detection and Decision Support. *Sensors*, vol. 19, no. 22, Nov. 2019, p. 4935 <https://www.mdpi.com/1424-8220/19/22/4935/pdf>
3. Victoria Morgan, Lisseth Casso-Hartman, David Bahamon-Pinzon, Kelli McCourt, Robert G. Hjort, Sahar Bahramzadeh, Irene Velez-Torres, Eric McLamore, Carmen Gomes, Evangelyn C. Alocilja, Shoumen Palit Austin Datta and Diana C. Vanegas (2019) *Sensor-as-a-Service: Convergence of Sensor Analytic Point Solutions (SNAPS) and Pay-A-Penny-Per-Use (PAPPU) Paradigm as a Catalyst for Democratization of Healthcare in Underserved Communities. Diagnostics* 2020, 10 (1), 22 <https://doi.org/10.3390/diagnostics10010022>
4. Eric S. McLamore, R. Huffaker, Matthew Shupler, Katelyn Ward, Shoumen Palit Austin Datta, M. Katherine Banks, Giorgio Casaburi, Joany Babilonia, Jamie S. Foster (2019) Digital Proxy of a Bio-Reactor (DIYBOT) Combines Sensor Data and Data Analytics for Wastewater Treatment and Wastewater Management Systems. *Nature Scientific Reports* 10, 8015 (2020). <https://doi.org/10.1038/s41598-020-64789-5> and <https://www.nature.com/articles/s41598-020-64789-5>
5. E. S. McLamore, J. Jones, Y. G. Yingling, S.P.A. Datta, P. Lambrianides and E. Vayn (2020) *Systems Engineering Paradox in Sensor Design: Divergence between Sensor-as-a-Product vs Sensor-as-a-Service* (in press)

Publications, additional ♦ <https://bit.ly/Google-Scholar-SD>

1. Datta S, Soong CJ, Wang DM, Harter ML. 1991. Purified Adenovirus 289R E1A Protein Stimulates Pol III Transcription in vitro by altering transcription factor IIIC. *J. Virology* 65 5297-5304 (<http://jvi.asm.org/cgi/reprint/65/10/5297>)
2. Datta S, Magge S, Madison L, Jameson JL. 1992. Thyroid Hormone Receptor Mediates Transcriptional Activation and Repression of Different Promoters. *Molecular Endocrinology* 6 815-825 <http://dspace.mit.edu/handle/1721.1/42834>
3. Putlitz J, Datta S, Madison L, Jameson JL. 1991. Human Thyroid Hormone Receptor Produced in Recombinant Baculovirus-infected Insect Cells. *Biochem & Biophys Research Communication* 175 285-290 <http://dspace.mit.edu/handle/1721.1/42901>
4. Chatterjee VKK, Nagaya T, Datta S, Madison L, Rentoumis A, Jameson JL. 1991. Thyroid Hormone Resistance Syndrome: Inhibition of Normal Receptor Function by Mutant Thyroid Hormone Receptors. *J. of Clinical Investigation* 87 1977-1984 <http://dspace.mit.edu/handle/1721.1/42900>
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Synergistic Activities

1. Datta, S. (2015) L'Internet des Objets : la troisième révolution industrielle. *Logistique and Management* 23 n°3 29-33 DOI: 10.1080/12507970.2015.11742760 • <http://www.tandfonline.com/doi/abs/10.1080/12507970.2015.11742760>
2. Datta, S. (2015) Dynamic Socio-Economic Disequilibrium. *Journal of Innovation Management* 3 3 4-9 <https://pdfs.semanticscholar.org/6309/3e17a0f4633fcddfbbedd3e9876f6891e73b.pdf>
3. Datta, S. (2012) Unified Theory of Relativistic Identification of Information in a Systems Age: Convergence of Unique Identification with Syntax and Semantics through Internet Protocol version 6 (IPv6). *International Journal of Advanced Logistics* 1 66-82 <https://www.tandfonline.com/doi/abs/10.1080/2287108X.2012.11006070> • <http://dspace.mit.edu/handle/1721.1/41902>
4. Datta, S., Granger, C. W. J., Barari, M. and Gibbs, T. (2007) Management of Supply Chain: an alternative modeling technique for forecasting. *Journal of the Operational Research Society* 58 1459-1469 <http://dspace.mit.edu/handle/1721.1/41906> Online published version <http://www.tandfonline.com/doi/full/10.1057/palgrave.jors.2602419>
5. Datta, S. (2004) Adapter, optimiser, prévoir - La convergence des concepts, des outils, des technologies et des normes peut-elle accélérer l'innovation? *Logistique and Management* 12 n°2 • MIT Library <http://dspace.mit.edu/handle/1721.1/41907> <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.201.8148&rep=rep1&type=pdf>

PUBLICATIONS – ORGANIZED BY CATEGORY

CATEGORIES

- Bio-medical Research, Sensors for SARS-CoV-2, Public Health, Neuro-Endocrinology
- Healthcare, Bio-medical Engineering, Medical Devices, Data & Analytics
- Sensor Engineering, Sensor Networks, Data & Analytics
- Digital Transformation, Internet of Things (IoT)
- Operations Management, Supply Chain, RFID, IoT
- Energy Innovation (renewables, biosystems innovation)
- Public K-16 Education, STEM, Professional Development

WORK IN PROGRESS

Datta, Shoumen (2024) *Healthcare: Solutions for a Better World?* Presentations (Parts 1, 2 & 3 drafts) are available (download) from the MIT Library repository <https://dspace.mit.edu/handle/1721.1/153283>

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PUBLICATIONS BY CATEGORY

MEDICAL RESEARCH • SARS-CoV-2 SENSORS • PUBLIC HEALTH • NEURO-ENDOCRINOLOGY

McLamore, Eric S. and **Datta**, Shoumen P.A. (2023) *A Connected World: System-Level Support through Biosensors* Ann Rev Analytical Chem vol. 16 <https://doi.org/10.1146/annurev-anchem-100322-040914>

Geisianny Moreira, Delphine Dean, Hanyu Qian, Shoumen **Datta**, Nikolay Bliznyuk, Diana Vanegas and Eric McLamore (2023) *Development of a DNA aptamer-based electrochemical biosensor for detection of SARS-CoV-2 Omicron in saliva*. 33rd Anniversary World Congress on Biosensors (June 2023, S. Korea).

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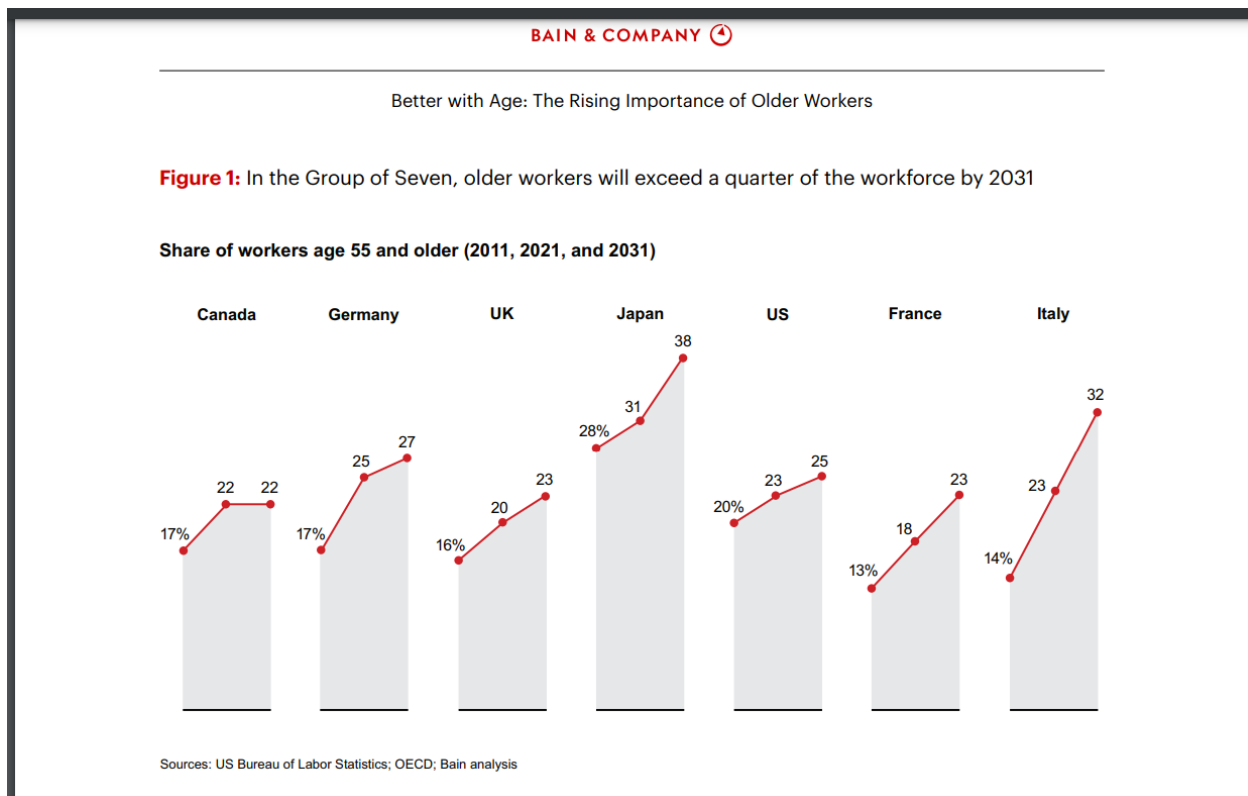
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