Welcome!

Spring 2007 Course
HST.921: Information Technology in the Healthcare System of the Future

http://web.mit.edu/hst.921/www

Lectures: Thursdays, 3:30-5:00pm
Tutorials: Thursday, 5:15-6:30pm
Harvard Medical School, Medical Education Center (MEC) - 260 Longwood Avenue, Boston, MA
Agenda

• Welcome and Introductions
• Course Mission Statement
• Course Overview
  – Faculty, Students, and Sponsors
  – Lectures
  – Tutorials
  – Practicum – Projects and Final presentations
• FAQs
  – Registration & Credit
• Q&A
Mission Statement

The mission of this course is to empower students to critically analyze a current -- or future -- problem in health care, and working in teams, to develop a novel solution using information technologies.
Course Overview
Course Faculty

**Steven Locke, MD**
Associate Professor of Psychiatry, HMS; Associate Professor of Health Sciences and Technology, MIT

**Jeff Blander**
Co-founder & Executive Director
Bienmoyo Foundation

**Bryan Bergeron**
President
Archetype Technologies, Inc.

**James Carter, MD**
Research Psychologist, Center for Clinical Computing at Beth Israel Deaconess Medical Center; Instructor, HMS

**Daniel Sands, MD, MPH**
Director, IBSG Healthcare; Director of Medical Informatics, Cisco
Project Consultants

- Mirena Bagur
  - Principal, CONTeXO Consulting
- Liz Boehm
  - Principal Analyst, Forrester Research
- Sherri Dorfman
  - Founder, Stepping Stone Partners
- Gary Hirsch, M.S.
  - Consultant
# Students

## Harvard
- HMS
- HSPH
- HBS
- KSG
- HGSE
- FAS
- HLS
- Affiliated hospitals

## MIT
- HST
- Computer Science
- Electrical Engineering
- Biomedical Engineering
- Media Lab
- Sloan School
Student Affiliations

- HMS: 42%
- Other: 3%
- KSG: 5%
- HBS: 12%
- Sloan: 8%
- HSPH: 8%
- HBS/HMS: 8%
- HST: 9%
- HSDM: 5%
## Sponsors

<table>
<thead>
<tr>
<th>Course Sponsors</th>
<th>Other Participating Organizations</th>
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<tbody>
<tr>
<td><img src="healthways.png" alt="Healthways" /></td>
<td>• Archetype Technologies, Inc.</td>
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<tr>
<td><img src="vanguard.png" alt="Vanguard" /></td>
<td>• Center for Clinical Computing, Beth Israel Deaconess Medical Center</td>
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<td>• Veritas Health Solutions LLC</td>
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</table>
Technology-driven Healthcare

- Speech recognition
- OCR
- LCDs
- Security
- DNA Mapping
- ASP
- Printers
- Wireless
- PDAs
- Laptops
- Cell Phones
- Email
- Internet

Custom drugs
Home monitoring
EMR
PHR
ePrescribing
Self-diagnosis
Disaster preparedness
Behavioral health services
Telemedicine
Disease surveillance

Healthcare Systems
Computer-assisted care

- Interactive informed consent
- Computer-based self assessment tools
- Evidence-based decision support tools
- Guideline-driven treatment algorithms
- Multimedia patient education at time of diagnosis
- Home-based monitoring of treatment response
- Home-based monitoring of side effects
- Patient-clinician e-mail
Computer-assisted care 2

- Computer-assisted self-help Rx via IVR, Web
- Graphic reports to case managers and PCPs
- Automated alerts for adverse events
- Automated alerts for suicide risk
- Automated pharmacy reports
- Interactive patient education
- Tailored, patient education materials
- Interactive advanced directives
Many of our economy’s greatest companies began as disruptive innovators.

Intel
Sun
Microsystems
Compaq
Dell
EMC
Microsoft
Nucor

Merrill Lynch
Charles Schwab
Bloomberg
AT&T
Cisco
Sprint PCS
Nokia

Toyota
Honda
Sony
Barnes & Noble
Amazon
Sears
Wal-Mart

Source: Christensen CM.
Venture Capital Deal Flow

Business Plans Received

Projects Evaluated

Projects Funded
# Lectures

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Faculty</th>
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<tr>
<td>Feb 8</td>
<td>Welcome &amp; Course Introduction; History of Cybermedicine</td>
<td>Course Faculty; Warner Slack, MD</td>
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<tr>
<td>Feb 15</td>
<td>Telehealth: The Future of Healthcare</td>
<td>Joseph Kvedar, MD</td>
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<tr>
<td>Feb 22</td>
<td>Building the Health Informatics Chunnel: The PHR Meets the EHR</td>
<td>Daniel Sands, MD, MPH</td>
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<td>Mar 1</td>
<td>The Future of Electronic Health Records</td>
<td>John Halamka, MD, MPH</td>
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<tr>
<td>Mar 8</td>
<td>Creating High Impact Social Ventures for Global Health</td>
<td>Jeffrey Blander, MS</td>
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<td>Mar 15</td>
<td>Convergence Informatics: The Future of Clinical Innovation</td>
<td>Keith Strier, JD, PAHM</td>
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<td>Mar. 22</td>
<td>The Future of Enterprise Computing in Healthcare</td>
<td>John Glaser, PhD</td>
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<tr>
<td>Apr 5</td>
<td>Biomimetics, Robotics, and Embedded Systems in Healthcare</td>
<td>Bryan Bergeron, MD</td>
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<td>Apr 12</td>
<td>Developing a Winning Business Plan</td>
<td>Eugene Hill, MBA</td>
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<td>Apr 19</td>
<td>The Future of Disease Management</td>
<td>Steven Locke, MD</td>
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<td>Apr 26</td>
<td>Interactive Multimedia in Healthcare</td>
<td>James Carter, PhD</td>
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<tr>
<td>May 3</td>
<td>Entrepreneurs Panel</td>
<td>Steven Locke, MD</td>
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# Tutorials and Assignments

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<tr>
<th>Date</th>
<th>Tutorial/Practicum 5:15-6:30</th>
<th>Faculty</th>
<th>Milestones</th>
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<tr>
<td>Feb 8</td>
<td>Project Description and Overview</td>
<td>Locke, Yoo</td>
<td>Registration</td>
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<td>Feb 15</td>
<td>Project Presentations and Discussion/Q&amp;A</td>
<td>Locke and Faculty</td>
<td>Project Proposals Due</td>
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<td>Feb 22</td>
<td>Project Team Meeting 1</td>
<td>Locke; and Faculty</td>
<td>Project Selections Due</td>
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<td>Mar 1</td>
<td>Event Diagramming</td>
<td>Bergeron, Yoo</td>
<td>Reflection Paper 1 Due</td>
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<td>Project Team Meeting 2</td>
<td>Faculty</td>
<td>Stakeholder Analysis Due</td>
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<td>Tour of Center for Medical Simulation</td>
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<td>Project Team Meeting 3</td>
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<td>Project Track Review Due</td>
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<td>Apr 12</td>
<td>Part I: The Elevator Pitch</td>
<td>Eugene Hill and</td>
<td>Event Diagram &amp; Porter Analysis Due</td>
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<td>Classroom Simulation</td>
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<td>May 3</td>
<td>Project Team Meeting 6</td>
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<td>Reflection Paper 3 Due</td>
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Entrepreneurs Panel

Bryan Bergeron, MD
Eugene Chan
Stephen Hau, MD
Daniel Sands, MD
Allan Guo, PhD
Mirena Bagur

Steven Locke, MD (Moderator)
Projects & Final Presentation
Group Design Projects

• Student, faculty or corporate sponsor driven
• Common elements for each project
• Track selection
• Group final presentations and paper
Common Elements

1. Objective of the group project
2. Proposed product or service solution
3. Industry summary
4. Analysis
   1. Problems with current solutions
   2. Competitive analysis
   3. Porter model
   4. Evaluation of macro-industry forces
   5. Micro-stakeholder analysis
5. Interaction diagrams
6. Reflection on cost, quality, and access
Project Track Selection

- Track 1: Marketing Plan
- Track 2: Business Plan
- Track 3: Product Design Plan
- Track 4: Clinical Trial/Product Evaluation

Each team chooses two out of four
Market Plan

1. Market Background
2. Future Directions of Market
3. Market Size/Forecast
4. Customers/Customer Segmentation
5. Target Market Segments
6. Product Description
7. Pricing
8. Promotion
9. Sales and Distribution Strategy
Business Plan

1. Partnering
2. Staffing Plans
3. Advisory Board
4. Risk Management (analysis of specific risks and address various scenarios)
5. Financial Projections and Resources Required
6. Near Term Milestones and Expenses
7. Long Term Projections
Product Design

The Product
1. Product Definition and Goals
2. Product Requirements/Specifications
3. Expected Product Lifecycle
4. Product Add-ons, Third Party Tool Sets
5. Follow-on Products

User Profile (Differentiate from buyer)
1. Job Description
2. User Skills, Knowledge and Education
3. Work Style
4. Concerns
5. Wants
6. Requirements
7. Work Environment
Clinical Trial

1. Rationale
2. Objectives
3. Study design and hypotheses
4. Participants
5. Intervention
6. Primary and secondary endpoints
7. Sample size (optional)
8. Anticipate time frame for study completion
9. Data collection; sub-protocols, intervals, encounters, events
10. Analysis
Example Projects

- Kurzweil Technologies, Inc.: [Creating a Web Presence for Specialty Practices](#)
- Institute of Cybermedicine/ABCD/HSPH: [Development of Virtual Social Support Communities](#)
- Institute of Cybermedicine: [On line delivery of programs for parenting and/or child abuse](#)
- MGH Anesthesia: [Web-Based Specialty-Specific Residency Clearing House](#)
- Pfizer Health Solutions: [Web-enabling a mind/body program to manage high utilizing somatizing patients](#)
Example Projects

- Johnson and Johnson: Breast Center manager Market Research/Roll-out in Europe
- Radiology.com Patientexpress(TM): An internet service for personal management (storage & access) of medical images
- Harvard Vanguard Medical Associates: Techniques for Decreasing Medication Morbidity in the Patient with Sensory or Cognitive Impairments
- Emerald Solutions/IOC: Development of Strategy for a Secure Clinical Web Environment
FAQ’s

• Course auditing
• Project selection
• Required readings
• Required paper
• School-specific credit
• Work load
• Attendance
Registration and Credits

MIT Students
Go to WebSIS (student.mit.edu) and follow links to pre-registration. Add HST.921 and HST.923 to your pre-registration.

Harvard Students
https://crossreg.harvard.edu/OASIS/CrossReg/index.html
## Registration and Credits

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Handouts and Website

- Syllabus
  - Lecture topics and readings
  - Tutorial topics, readings and assignments
  - Mostly online
- Group design project tracks
- Website:
  http://web.mit.edu/hst.921/www
Questions and Discussion