RESEARCH BRIEF OVERVIEW

Latent Semantic Indexing of Committee Preferences in Healthcare Innovation Systems

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October 16, 2007
Researcher’s Background
David Andre Broniatowski

• Research Interests
  – Multi-Stakeholder Preference Elicitation and Modeling
  – Innovation in Government-Regulated Systems
    • Health Care and Aerospace Systems
  – Semiotics

• Education
  – 2\textsuperscript{nd} year doctoral student, ESD ‘09
  – S.M. Aerospace Engineering (MIT ‘06)
  – S.M. Technology and Policy (MIT ‘06)
  – S.B. Aerospace Engineering (MIT ’04)

• Professional Experience
  – Center for Strategic and International Studies
  – XPRIZE Foundation
  – NASA HQ Office of Program Analysis and Evaluation
Motivation

• Innovations that accomplish systems integration in the health care sector have a strong potential to improve medical practice, but are often blocked by “silo-thinking”

• Engineering of complex systems typically involves group decision-making, requiring input from many disciplines and professional cultures.

• Determination of stakeholder preferences is difficult due to lexical ambiguity surrounding professional jargon and lack of access to key stakeholders.

• The application of natural language processing methodologies provides a means to determine stakeholder preferences and/or biases on the basis of written or spoken text.

• Methods extensible to committee decision-making and complex systems solutions in other sectors
Project Title: Latent Semantic Indexing of Committee Preferences in Healthcare Innovation Systems

Sponsor: MIT-Portugal Program

Goal: To develop and demonstrate a methodology for the determination of stakeholder preferences and alignment in engineering systems. To develop a theory for stakeholder preference evolution.

Approach: Analysis of FDA medical device approval committee meeting transcripts using Latent Semantic Indexing (LSI) derived Natural Language Processing techniques
Anticipated Contributions

**Expected Outcomes:**
- Methodology for determining stakeholder preference convergence from spoken and written text
- Theory for stakeholder preference evolution over time

**Broader Impact:**
- Enable understanding of stakeholder preference evolution with respect to complex multi-disciplinary systems

**Knowledge Deployment:**
- Methodology-focused paper for 2008 Conference on SE Research (CSER)
- Future paper aimed at building theory of preference evolution
- Usable methodology for analyzing multi-disciplinary committee text