

Spring 2009 - New Seminar Course

EE392m - Fault Diagnostics Systems

Units	1
Time	Tuesdays, 2:15-3:30pm
Place	McCullough 122
Coordinator	Dimitry Gorinevsky, Consulting Professor of EE
Prerequisites (helpful but not mandatory)	Stat 116; EE263 or Eng 207a; EE278 or Eng 207b
Website	www.stanford.edu/class/ee392m/

Description

Computer systems are used for control, automation, resource management, and many other mission and safety critical functions. Fault diagnostics and system health monitoring are important functions in such systems. In critical real-time applications, a significant part of embedded system software is related to diagnostics; in control systems, fault diagnostics might take up 80% of the real-time logic.

The goal of this seminar course is to overview diagnostic systems engineering as it is done in engineering practice. The course will emphasize more intellectually stimulating approaches that are usually referred to as 'advanced' in industry. Exposure to diagnostics system practice could be helpful for industrial careers of graduates in most areas of engineering and computer science.

Students interested in mathematical aspects of engineering systems would benefit from understanding real-life constraints in implementing advanced diagnostics functions. Learning about practical systems exposes the existing gap between advanced research and state of the art engineering. Understanding this gap is an important step on the way to making a real-life impact with advanced mathematical methods.

The methods that are successful in industrial practice are often applied by engineers with undergraduate degrees. Thus, much of the course should be understandable without prerequisites. A deeper understanding of the technical material might require the listed course prerequisites.

The course will consist of guest lectures (seminars) given by experts from several key industries which use diagnostics in its systems. The guest lectures are co-sponsored by NASA and will be presented at NASA Ames facility the same day as the Stanford lecture. The lecture topics include

1. Network fault diagnostics – EMC
2. Process and equipment fault diagnostics in IC manufacturing – Intel Corp
3. Integrated aircraft diagnostics system – Honeywell
4. Jet engine diagnostics – GE Infrastructure
5. Automotive engine diagnostics – Ford Motor Co
6. Computing system diagnostic monitoring – Sun Microsystems
7. Fault management in aircraft flight systems – Lockheed Martin
8. Fault diagnostics of medical equipment – to be confirmed
9. Diagnostics of abnormal situations in process plants – to be confirmed