Syllabus

ESD.944 Engineering Systems Scholarship Seminar

Fall Semester 2009 v3
Engineering Systems Division
Massachusetts Institute of Technology

Summary

ESD.944 Engineering Systems Scholarship Seminar
H-Level, Fall Semester
Prereq: permission of instructor
Units: 1-1-4

Panel discussions, presentations, workshops, and peer-review exposes doctoral students to the skills and strategies for publishing in scholarly journals, writing grant proposals, applying for and succeeding in academic jobs, and shaping doctoral and post-doctoral research to further career goals. Special emphasis is placed on the landscape of systems journals and the interdisciplinary acuity necessary for publishing in the broad range of journals of interest to engineering systems researchers. Students prepare a paper for submission to a journal.

Instructors: *Olivier de Weck and staff*
Collaborators: *Katherine Dykes* (and ESS Engineering Systems Student Society), Elizabeth Milnes

Motivation:

The old adage "publish or perish" is alive and well in academic professional life. Despite new media such as blogs and open access journals it remains of critical importance to write up and publish ones research findings in high-quality peer-reviewed journals. The list of publications is the most important constituent of an aspiring researcher's CV in academia, as well as industry and government research laboratories.

To most of us writing and publishing does not come naturally. It is a skill that has to be acquired and continuously exercised and nurtured. The challenge is perhaps even more pronounced in an emerging field like Engineering Systems where the academic landscape and concomitant norms and expectations are still evolving. Unfortunately, there are only few opportunities to acquire such skills in a structured way.

We will offer a weekly scholarship seminar on an experimental basis in the fall of 2009 to provide assistance and stimulus to doctoral students with respect to publishing. The seminar will also go beyond publishing and discuss research strategy, grant writing and career planning.

Objectives:

In a recent survey of Engineering Systems doctoral student alumni 21 doctoral students out of 51 responded, and 90% reported conference participation. Of the responds, however, only 52% reported publications in peer-reviewed journals as a result of their work at MIT. We would like for all ESD doctoral students to publish their research in high-quality peer reviewed journals.

In a broader sense the objectives of offering this seminar are:

- Prepare graduate students for careers in academia
- Increase their competitiveness for academic positions
- Learn to make the most of an interdisciplinary background
- Understand how to do good research and scholarship
- Learn about the Engineering Systems academic community and how to connect with the broader community

Specific Learning Objectives:

- To understand the landscape of Engineering Systems journals, conferences and programs
- Be able to transform active research into professional presentations and journal articles
- To improve skills in critiquing and writing peer-reviewed journal articles and having them published
- Be able to identify suitable academic positions and know how to successfully pursue them
- To understand the challenges and rewards of life as a post-doctoral associate and assistant professor

Format:

- Series of lectures and panel sessions on topics of interest
- Parallel paper writing project and complementary mini-assignments

Units: 1-1-4 (6 units)

1 hour lecture or panel session each week

1 hour of "lab", i.e. recitation
(in a contiguous 2-hour block if possible)

4 hours of individual work/preparation

Schedule

After surveying interested students we have settled on the following schedule

Friday 11-12 – Lecture
Friday 12-1 – Recitation

Room E40-298 (to be confirmed)

Lecture and Discussion Topics:

1. Landscape of Systems Journals, Conferences and Academic Programs[1] (Panel)
2. Perspective of an Editor-in-Chief: What makes a good scholarly paper? (David Simchi-Levi / Richard Larson)
3. Writing a journal publication (2-3 sessions) (Natasha Schull / ??)
    a. Mapping arguments
    b. Writing with theory / presentation of analysis
    c. Writing about theory
    d. Incorporating the Literature
    e. References & Footnotes
    f. Choosing a journal / Writing for an Audience
4. Paper review and revision process (Olivier De Weck)
5. Visibility / Research Impact (Christopher Magee / Yossi Sheffi)
    a. Promotion / Web of Citations and H-Index
    b. Turning academic research into a book
6. Grant Proposal writing / Proposal evaluation and Selection (NSF Representative)
    a. Integrating industry partners into academic research
7. Post-Docs: successfully obtaining one and how to get the most out of them (Panel)
8. Applying to faculty positions / Faculty search committees (Erica Fuchs / Olivier De Weck)
    a. Different types of programs
    b. Life as an assistant professor
9. Coupling research and career strategy development (Nancy Leveson)
    a. Choosing classes, domains and methodologies
    b. Publishing and networking within domain and methodology spheres

[1] Invite representatives from each cluster. Pre-reading Bounova paper.

10. Long term challenges in Systems research and career growth (Discussion)

Assignments:

- Smaller assignments:
    - Critique of professional journal papers

- Paper Project: write a journal paper by following a step-by-step process
    - Individual assignments
    - Discussion and revisions
    - Peer review and feedback on each others drafts

Detailed Schedule:

Date	Topic	Participants*	Notes
11 Sep	Landscape of systems journals	de Weck	
18 Sep	Journal editor's perspective	Simchi-Levi, Leveson	
25 Sep	What makes a classic paper?	Larson	
2 Oct	Journal paper writing	Frey, Schull?	
9 Oct	Journal paper submission	Whitney, Schull?	
16 Oct	Journal paper revising	de Weck	
23 Oct	Measuring impact: citations	Magee	
30 Oct	Turning research into a book	Sheffi, Roos	
6 Nov	Grant proposal writing	Webster	
13 Nov	Life as a postdoctoral associate	Yang et al.	
20 Nov	Applying for faculty positions	Fuchs	
4 Dec	Life as an assistant professor	ESD asst profs	
11 Dec	Career planning and growth	Leveson	

* to be confirmed

References:

Bounova, G., "Survey of Engineering Systems journals and faculty", 2006