Life is the Journey, not the Destination

Graduate School is the Process, not the PhD Diploma

Abraham Matta
Computer Science
Boston University
Quick Tour of Some PhD Journey

- **YEAR 1**: like a BABY 😊 learning to speak & survive / adapt to the new world
- **YEAR 2**: like an APPRENTICE, learning the tricks of the trade from advisor & research group
- **YEAR 3**: realizing that you DIDN'T KNOW MUCH!!
- **YEAR 4**: forget it - time to THINK; something has to come out different 😊
- **YEAR 5**: more like a colleague to your advisor ... like a SALESMAN - but be yourself & pray you get the job you like 😊
Beginning of First Year
First Impressions

- Usually a TF
- Communicate with academic advisor
- Do VERY well in courses
- Adapt to culture/new system (new ethical and social rules)
- Improve English
- Improve teaching & communication skills
- Find a way to play your favorite sports 😊
By End of First Year
Find a Research Advisor

- Learn of faculty interests & projects
- Zoom in on own research interest
- Approach research advisor who will provide RA or TF support
  - Advisors are CFO's
Beginning of Second Year
Build Trust with Advisor

- Contribute to ongoing project
- Learn how to read research papers
- Learn how to THINK (don’t just shoot your mouth off 😊)
- Learn how to
  - Use tools: analytical, simulation, system implementation
  - Work with advisor (and other team members)
By End of Second Year
Write & Submit

- Learn how to write
- Submit FIRST paper
- Perhaps help with a grant proposal
- Pass Area PhD Depth Exam (aka DWE)
- Good time for summer internship
Beginning of Third Year
Present & Network

- Hopefully FIRST publication
- Go to workshop or conference
- Learn how to present
- Talk to people about your work
- Be more critical in own thinking
- Start mentoring more junior students
By End of Third Year
Realize “I didn’t know much”

- Read broadly AND deeply
- Synthesize own focus area
  - Usually related to future PhD thesis
  - Advisor is important!
- Pass Area PhD Oral Exam
Fourth Year
THINK, THINK, THINK

- Time to zero in on specific problem for PhD thesis
  - Ask good questions
  - Outline a solution approach
  - Advisor is important!
- Publish your FIRST thesis-related paper
- Defend own thesis proposal
- Perhaps help with a grant proposal
Fifth (and Final 😊 Year
More of a Colleague to Advisor

- Continue to do good thesis work
- Publish in journals too
- Prepare CV & apply for jobs
- Prepare interview talk
- Travel for job interviews
- Write thesis
- Get job, defend & graduate 😊
- Again, advisor is REALLY important!
## Summary of the Journey

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<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
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Your Thesis Advisor
CTO+CEO+CFO

- Knowledge / scholarship / interesting research program (CTO)

- Wisdom + trust (CEO)

- Financial support (CFO)
A Good Thesis Advisor

- Unpretentious
  - Get down to your level
  - Learn with you
- High standards
  - Lift you up

- Like a parent?
- Like a master?

- First, a coach / mentor
- Then, a colleague / mentor, for LIFE 😊
As your student, what basic analytical tools should I know or learn?

- Probability & statistics (CS 670)
- Basic queuing theory (CS 670)
- Basic optimization (CS 556)
- Basic control theory (CS 556)
- Basic game theory (CS 556 or ENG SC 700)
- Algorithmics (CS 559)
A Specimen Academic/Course Schedule for a Networks PhD Student

- **PhD course requirement:** 2 theory + 4 applied (at least 1 from each of software, applications & systems)

- **YEAR 1 (2 systems, 2 theory):** OS-I (CS 552), Algorithms (CS 530), Networks-I (CS 655), Complexity (CS 535)

- **YEAR 2 (2 systems, 1 SW, 1 app):** Networks-II (CS 556), Compilers (CS 525), Performance (CS 670), Databases-II (562)

- **YEAR 3:** Algorithmics (CS 559), Computational Geometry (CS 532), Cryptography (CS 538), Directed Study

- **YEAR 4:** Directed Studies ...