

A Thesis Envisioned

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for Intro to PhD class

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Abstract

I plan to fuse algorithms and systems knowledge, to design, evaluate, and implement novel protocols/algorithms for all areas of systems. While many systems researchers have a solid understanding of algorithms, it seems that the algorithms theory supporting many emerging areas of systems is rather disconnected from applicable research already existing within the algorithms community.

1 Subject Area

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In particular, my current focus has been on routing/mac protocols for wireless networks targeting real-world sensor network applications as well as very general ad-hoc network theory. I feel that many of the current “classics” in wireless routing protocols are intrinsically flawed or impractical due to immature understanding of a very complex system (wireless networks). While many would consider routing protocols a mature area with too much redundancy already, I would like to see more convergence towards standards that actually work (and make sense).

On top of this, I am very open to new areas or applications of design. I have been very interested and worked on applications of algorithms to hardware design, scheduling algorithms, and bioinformatics.

2 General Goals Outline

- **Year 1:** Hone my skills in all aspects applying to my future research projects, this includes: literature surveys, problem formulation, algorithm/solution design, protocol description, theoretical analysis, implementation, real-world and simulated evaluation, presentation of conclusions and related writing/publication.
- **Year 2:** Goal of publishing a few papers, preferably finding the right conference for publications and projects resulting from work in my first year, and to identify a long term problem to which I may apply my learned research skills.
- **Year 3:** Publish a “hot” paper presenting, describing, and justifying the long-term problem identified in year 2. I would also, like to have early solutions published or at least developed in some presentable form during this year.
- **Year 4:** Publish necessary solutions for the long term problem throughout this year. Finish the year by aggregating work into a final polished solution, aimed for journal publication.
- **Year 5:** Tie research together and prepare defense, while grabbing any low hanging fruit that is publishable by defense time.