

Varunyu Khamviwath

EDUCATION

- 2005 – present UNIVERSITY OF MINNESOTA, Minneapolis, MN
- **Ph.D. Mathematics**, Numerical Analysis/PDE minors, expected May 2011
 - **M.S. Mathematics**, September 2009
 - GPA 3.81/4.00
 - *Dissertation*: Directional Sensing and Polarization in D. Discoideum Amoebae (*Advisor*: Hans Othmer)
- 2002 – 2003 UNIVERSITY OF CALIFORNIA, Los Angeles, CA
- **M.S. Electrical Engineering**, Control Systems, December 2003
 - GPA 4.00/4.00
- 1998 – 2002 CHULALONGKORN UNIVERSITY, Bangkok, Thailand
- **B.Eng. Electrical Engineering**, 1st class honors, May 2002
 - GPA 3.65/4.00 (top 3% of graduating class)

RELEVANT COURSEWORK

- Diff. Equations • Ordinary and Partial Differential Equations, Dynamical Systems, and Functional Analysis
- Probability • Probability, Stochastic Processes, Kalman Filtering, and Statistics
- Applied Math • Mathematical Modeling, Math Biology, and Aeroelasticity Theory
- Control • Linear System Theory, Nonlinear Stability Theory, Optimal Control Theory, and Robust Control Theory
- Computation • Numerical Analysis and Optimization

PROFESSIONAL & RESEARCH EXPERIENCE

- 2006 – present UNIVERSITY OF MINNESOTA, Minneapolis, MN
- Research Assistant**, Math Biology Group
- Construct various models of reaction networks leading to cell motility. Use mathematical analysis and simulations to identify mechanisms as well as conditions necessary for dynamics and steady-state properties.
 - Optimize a PDE solver to improve computational speed by 80 times. Formulate and implement a custom finite-element algorithm for high-dimensional reaction-diffusion equations in 2D & 3D resulting in 20-time speed increase over the optimized solver. Develop visualizations and interfaces for problem customizations.
- Teaching Assistant**, School of Mathematics
- Lead discussions, tutor students, and grade class work in various mathematics classes including Linear Algebra, Differential Equations, Multivariable Calculus, and Abstract Algebra.
- Summer 2005 TONSON CAPITAL, Bangkok, Thailand
- Quantitative Analyst**
- Gained an exposure to equity markets. Developed an understanding in derivatives and proposed an arbitrage strategy. Analyzed portfolio risks and conducted statistical analysis of market data. Created VBA applications to automate retrieval and storage of daily market data into Excel spreadsheets. Assisted research analysts in technical subjects.
- 2004 – 2005 SERVO TECH INC., Chicago, IL
- Senior Electrical Engineer**
- Worked on fuel efficiency of heavy equipments and recapture of wasted energy by various means. Developed specifications, designed hybrid systems with 20% efficiency improvement, and performed cost-efficiency analysis. Proposed a control method to increase hydraulic efficiency from 30% to 90%. Gave presentations and assisted clients in identifying design flaws.
- 2001 – 2002 CHULALONGKORN UNIVERSITY, Bangkok, Thailand
- Research Assistant**, Control Systems Laboratory
- Extended a control theory to delayed systems. Implemented nonlinear optimization and a delay differential equation solver and used the modules to create a control-system design algorithm. Modeled building dynamics, designed seismic control systems, and tested the designs under different scenarios.

HONORS & AWARDS

- Summer 2007 Received **Fellowship** from the School of Mathematics, University of Minnesota.
- 1998 **Nationally Ranked 1st in engineering and 3rd in scientific subjects** in college entrance exam, Thailand.
- 1997 Received **Silver medal, Mathematics Olympiad**, Thailand.

COMPUTER SKILLS

- C/C++, FORTRAN, MATLAB, Mathematica, Python, VBA, Pascal, COMSOL, LabVIEW
- Expertise in numerical algorithms. Have knowledge in parallel programming.

COMMUNITY SERVICES & EXTRACURRICULAR ACTIVITIES

- 2007 – 2008 Vice president, Thai Student Association, University of Minnesota
2000 – 2002 Student official, rhetoric club and bridge club at Chulalongkorn University
2000 Organizing committee, CU Music Awards
1999 Organizer, university debate competition

MISCELLANEOUS

- 5th year graduate student, Preliminary exams passed (oral: September 2009, written: August 2007)



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