Hieu Huu Nguyen

Contact Information

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Research Interests

Wave propagation, parallel-in-time method, numerical linear algebra, multiscale method, Gaussian beam methods, scientific computing, machine learning, deep learning.

Education

Oden Institute for Computational Engineering and Sciences, UT Austin

Ph.D. in Computational Science, Engineering and Mathematics, May 2020

- Dissertation Topic: Parallel-in-time methods for high frequency wave propagation in heterogeneous media
- supervisor: Richard Tsai
- GPA: 3.80

M.S. in CSEM, December 2017

University of Minnesota, Twin Cities

B.S. in Physics, December 2013

- Emphasis on computational Physics
- Minor in Mathematics
- GPA: 3.83

Work Experience

Department of Mathematics and Computer Science, University of Basel, Switzerland

- Postdoctoral Researcher, July 2020 - current
- Supervisor: Ivan Dokmanić

Dell Technology, Austin TX

- Data Science Graduate Internship, June 2018 - Aug 2018

Publications

G. Ariel, H. Nguyen, R. Tsai, *θ-parareal schemes,* arXiv:1704.06882 (June 2017).

H. Nguyen, R. Tsai, *A stable parareal-like method for the second-order wave equation,* Journal of Computational Physics (2020).

H. Nguyen, R. Tsai, *Numerical wave propagation aided by deep learning,* arXiv:2107.13184 (Aug 2021).

Conference Talks

A stable parareal like scheme for the second-order wave equation, 8$^{\text{th}}$ Parallel-in-Time Workshop, ZiF, Bielefeld, Germany (May 2019).

Parallel-in-time for the second-order wave equation, Minisymposium at SIAM Computational Science and Engineering, Spokane, WA (Feb 2019).

Grants and Awards

2019	Juelich Supercomputing Centre Travel Grant to present at the 8th Parallel-in-Time Workshop, ZiF, Bielefeld, Germany
2014–2018	National Initiative for Modeling and Simulation Graduate Research Fellowship, Institute for Computational Engineering and Sciences
2014–2016	Vietnam Education Foundation Fellowship
2013	Edmond B. Franklin Scholarship, School of Physics and Astronomy, University of Minnesota, Twin Cities

Other Talks and Posters

Data-driven parareal for solutions of the wave equation, University of Basel (Jan 2020).

Parallel-in-time coupling of Gaussian beam and Direct Numerical Simulation, Workshop for Advances in Computational Sciences and Engineering, UT-Austin (Mar 2017).

θ-parareal for wave equation, Texas Imaging Symposium, UT-Austin (Oct 2018).

Gaussian beam method for high frequency wave propagation, Math Jr. Numerical Analysis Seminar, UT-Austin (April 2016).

Teaching Experience

Fall	2018	Teaching Assistant, Calculus I
Fall	2017	Instructor Intern, Mathematical Modeling
Fall	2015	Teaching Assistant, Calculus II
Spring	2013	Undergraduate Teaching Assistant, Physics II
Fall	2012	Undergraduate Teaching Assistant, Physics I

Extended Professional Course

Summer 2017	Math-to-Industry Bootcamp II, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis
Summer 2015	AARMS-PIMS Summer School in Differential Equations and Numerical Analysis, Department of Mathematics, Dalhousie Univeristy, Halifax, Canada

Graduate Coursework

- ❑ Numerical Linear Algebra
- ❑ Mathematical Modeling
- ❑ Functional Analysis
- ❑ Numerical Differential Equations
- ❑ Convex Optimization
- ❑ Multiscale Modeling
- ❑ Electromagnetic theory
- ❑ Acoustics
- ❑ Seismic Imaging
- ❑ Mathematical Methods in Engineering

Scientific Research Experience

2011–2012	Rendering art of Traveling Salesperson Problem. supervisor: Fadil Santosa, Institute for Mathematics and its Applications, University of Minnesota, Twin Cities.
2011–2012	Data analysis of neutrino experiment. supervisor: Gregory Pawloski, Department of Physics, University of Minnesota, Twin Cities.
2012–2013	Generation of magnetic field in magnetohydrodynamics. supervisor: Thomas Jones, Department of Astronomy, University of Minnesota, Twin Cities.
2014	Reduced model for chemical reaction systems. supervisor: Lam K. Huynh, Institute for Computational Science and Technology, Institute for Computational Science and Technology, Vietnam.

Relevant Skills

Languages:	Vietnamese (native), English (fluent), German (conversational)
Computer:	Linux, Python, MATLAB, Julia scikit-learn, Pytorch Deep Learning certificate, High Performance Computing, machine learning certificate at Texas Advanced Computing Center