

Anh Phong Tran

PHD CANDIDATE · CHEMICAL ENGINEERING

✉ anhphong.t@gmail.com | 🌐 www.phongatran.com | 📧 phongatran | 📄 phongatran

Education

Northeastern University

Ph.D. Candidate in Chemical Engineering (Advisor: Dr. Eduardo D. Sontag)

Boston, MA

Sept. 2014 - Dec. 2020

Northeastern University

M.S. in Electrical and Computer Engineering (Concentration in Communications, Control, and Signal Processing)

Boston, MA

Completed June 2020

Tufts University

B.S. in Chemical and Biological Engineering, Magna Cum Laude

Medford, MA

Graduated May 2013

Skills, Awards, and References

Research Interests

light optics, heat and mass transfer, reaction kinetics, high-performance computing, Monte Carlo methods, control theory, systems biology, cancer modeling, machine learning, computational geometry, neuroscience

Programming Languages

C++, MATLAB, Python, LaTeX, OpenMP, OpenCL, OpenACC & CUDA

Languages

French (Native), Vietnamese (Bilingual Proficiency) & Dutch (Limited Working Proficiency)

Honors & Awards

2014 **Northeastern University**, Distinguished Dean's Fellowship

Boston, MA

2011 **Bunker Hill Community College**, Academic Excellence Award

Charlestown, MA

Peer-Reviewed Publications

Total Citations: **33**, h-index: **4**, i10-index: **1** (Last updated: May. 2020). * indicates equal contributions.

“Transient diffusion into a bi-layer membrane with transfer resistance: Exact solution and time lag analysis”.

Tran, A.P., Meldon, J. H., and Sontag, E.D. In review, **Journal of Membrane Science**.

“Distributed implementation of Boolean functions by transcriptional synthetic circuits”.

Tran, A.P.*, Al-Radhawi, M.A.*, Ernst, E.A., Chen, T., Voigt, C.A., and Sontag, E.D. To appear, **ACS Synthetic Biology**.

“Delicate balances in cancer chemotherapy: modeling immune recruitment and emergence of systemic drug resistance”.

Tran, A.P.*, Al-Radhawi, M.A.*, Kareva, I., Wu, J., Waxman, D.J. and Sontag, E.D., 2020. **Frontiers in Immunology**, 11, p. 1376.

“Modeling voxel-based Monte Carlo light transport with curved and oblique boundary surfaces”.

Tran, A.P. and Jacques, S.L., 2020. **Journal of Biomedical Optics**, 25(2), p.025001.

“Improving model-based functional near-infrared spectroscopy analysis using mesh-based anatomical and light transport models”.

Tran, A.P., Yan, S. and Fang, Q., 2020. **Neurophotonics**, 7(1), p.015008.

“Selective photobiomodulation for emotion regulation: model-based dosimetry study”.

Tran, A.P.*, Cassano, P.*, Katnani, H., Bleier, B.S., Hamblin, M.R., Yuan, Y. and Fang, Q., 2019. **Neurophotonics**, 6(1), p.015004.

“Dual-grid mesh-based Monte Carlo algorithm for efficient photon transport simulations in complex three-dimensional media”.

Yan, S., Tran, A.P. and Fang, Q., 2019. **Journal of Biomedical Optics**, 24(2), p.020503.

“On the estimation of high-dimensional surrogate models of steady-state of plant-wide processes characteristics”.

Tran, A.P. and Georgakis, C., 2018. **Computers & Chemical Engineering**, 116, pp.56-68.

Work Experience

Northeastern University

Boston, MA

Research Assistant, Advisor: Dr. Eduardo Sontag

Sept. 2018 - Present

- Modeling of the immune-tumor-drug interactions during metronomic chemotherapy and the emergence of drug resistance
- Development of new chemotherapy drug regimens based on optimal control theory
- Synthetic biology

Research Assistant, Advisor: Dr. Qianqian Fang

May. 2016 - Aug. 2018

- Developed a new 3D mesh generation workflow for the human head (Brain2mesh).
- Algorithm improvement for the simulation of light transport inside biological tissues using graphics processing units (MMC/MCX).
- Dosimetry of near-infrared light using transcranial and intranasal shedding for the treatment of major depressive disorders

Teaching Assistant

Jan. 2015 - May. 2016

- CHME 4512: Chemical Engineering Process Control
- CHME 3313: Transport Processes 2 and Separations

Tufts University

Medford, MA

Researcher in Chemical Process Control, Advisor: Dr. Christos Georgakis

Jan. 2014 - Aug. 2014

- Developed a new approach to create high-dimensional steady-state surrogate/approximate models of industrial plant-wide processes.
- Applied D-optimal designs to reduce considerably calculation costs and net-elastic regularization techniques to avoid overfitting issues.
- Demonstrated the applicability of surrogate models to study difficult operability problems such as the snow-ball effects in processes with recycle streams, operating cost optimization in high-dimensional spaces, plant-wide heat integration, and control of the product quality.

Researcher in Transport Phenomena, Advisor: Dr. Jerry H. Meldon

Jan. 2014 - Aug. 2014

- Solved transient permeation and heat conduction problems in layered composite materials with external transfer resistance.
- Applied Separation of Variables and Laplace transform techniques to solve partial differential equations.
- Proved the ability to accurately calculate mass permeation by combining the lead terms of "short-time" and "long-time" solutions.

Conference Presentations, Papers & Non Peer-Reviewed Publications

Tian, F., Varghese, J., **Tran, A.P.**, Fang, Q. and Gonzales-Lima, F. "**Effects of wavelength on transcranial laser stimulation: a Monte Carlo simulation study based on standard brain model**". In *Modeling PBM Dosimetry (11221-10)*. International Society for Optics and Photonics (Feb 2020).

Tran, A.P., Al-Radhawi, M.A., Kareva, I, and Sontag E.D. "**Finding the optimal metronomic chemotherapy regimen: a delicate balance between immune recruitment, cancer resistance, and drug cytotoxicity**".

AMS Special Session on Utilizing Mathematical Models to Understand Tumor Heterogeneity and Drug Resistance, 1154-92-2447 (Jan 2020).

Vanegas, M., **Tran, A.P.**, Laistler, E. and Fang, Q. "**Mobile phone camera-based SpO2 measurements using broadband light and colored paper filters**". In *Optics and Biophotonics in Low-Resource Settings V (10869-14)*. International Society for Optics and Photonics (March 2019).

Tran, A.P. and Fang, Q. "**Generating High Quality Tetrahedral Meshes of the Human Head and Applications in fNIRS**".

In *Optical Tomography and Spectroscopy* (pp. JTU3A-52). Optical Society of America (April 2018).

Yan, S., **Tran, A.P.** and Fang, Q. "**A dual-mesh Monte Carlo algorithm using a coarse tetrahedral mesh and voxel output**". In *Optical Tomography and Spectroscopy* (pp. JTh3A-17). Optical Society of America (April 2018).

Tran, A.P. and Fang, Q. "**Generation of high-quality tetrahedral head mesh models from MRI scans**". *43rd Northeast Bioengineering Conference, 224 (April 2017)*.

Sahin, S., Sun, X., Vanegas, M., **Tran, A.P.** and Fang, Q. "**Developing an Anatomically Accurate Multi-layered Optical Brain Phantom for fNIRS Studies**". In *Optical Tomography and Spectroscopy* (pp. JW3A-70). Optical Society of America (April 2018).

Tran, A.P. and Podlaha-Murphy, E.J. "**Electrodeposition of Ni-Fe-Mo-W Alloys**".

11th-12th Quarterly Report July-December 2015 AESF Research Project# R-117.

Meldon, J.H. and **Tran, A.P.** "**Analysis of transient permeation and conduction in composites with external mass transport resistance**". AIChE Annual Meeting, pp. 410g. (Nov 2015).

Meldon, J.H. and **Tran, A.P.** "**Facile Analysis of Transient Diffusion and Heat Conduction**". AIChE Annual Meeting, pp. 418v. (Nov 2014).