Pavel Alexandrovich Govyadinov

CONTACT INFORMATION

Ph.D Candidate (expected graduation, January 2019)
Department of Computer Science
University of Houston
W309 Engineering Building 2
Houston, TX 77031-4005, USA

Telephone +1-541-223-3689 (cell)
Email: pgovyadi@gmail.com

RESEARCH INTERESTS

My research interests are focused in biotechnology; specifically in the use of high-performance computing analysis, modeling and visualization of data relating to degenerative diseases and brain-related disorders. I am currently working on analyzing large sets of imaged microvasculature to classify organs based on their capillary networks. The future application of this technology is generating simplified, synthetic microvasculature for next-generation printed synthetic organs for transplant patients.

EDUCATION

University of Houston, Houston, TX, USA

Ph.D., Computer Science, 2019

- **Planned Dissertation:** *Segmentation, Analysis and Visualization of Large Microvascular Networks in the Rat Brain*
- **Advisor:** Dr. David Mayerich, Dr. Guoning Chen
- **Expected Graduation:** January, 2019

University of Oregon, OR, USA

M.S., Computer Science, 2014

- **Focus:** Parallel Computing Track
- **Advisor:** Dr. Allen Malony

B.S., Theoretical Physics, 2011

PROFESSIONAL EXPERIENCE

Neuroinformatics Center, University of Oregon (6/10-12/14)

Research Assistant

- Large data analysis for MREIT using high-performance computing.
- Data analysis using Matlab and custom, self-written C++ software.
- Hardware engineering of MREIT experimental systems.
- Computation modeling and experimental validation of MREIT software.

Electrical Geodesics Inc., Eugene, Oregon (9/10-12/14)

Software Engineer/ Research Assistant

- Project: *Use of Iontophoresis for Treatment of the Skin-Electrode Impedance* **(9/10-12/14)**.
  - Piloted experiments to research and quantify product effectiveness.
  - Developed software for analysis of data.
  - Responsible for documentation and proposals to the Institutional Review Board (IRB) for experimentation of human subjects.
- Project: *Development of finite difference method-based high performance forward and inverse problem solver* **(9/10-12/14)**.
  - Revisers engineered the architecture and improved run-time speed by 20% in OpenMP and Cuda implementations.
  - Created all documentation for product related software.
  - Designed regression testing suites.
- Project: *Conductivity Analysis for Improved High-Resolution EEG* **(5/12-12/14)**.
  - Involved with the development of the experiment for the grant.
  - Created all the necessary documents for the IRB review process.
  - Trained other research assistants on the use of the data analysis hardware

and software.
    - Lead all of aspects of the data collection, including, but not limited to data acquisition and data analysis.
- Research Assistant: *Transcranial Electrical Stimulation (tES)* **(4/13-12/14)**.
    - Extended the functionality of the modeling software to analyze and generate multi-variable simulations allowing for generation of thousands of individual runs in one.
    - Developed ways of validating results and worked on in a team to visualize the results.

PUBLICATIONS

[1] **Govyadinov, P. A.**, Womack, T., Chen, G., Mayerich, D., & Eriksen, J. **(2018)**. Robust Tracing and Visualization of Heterogeneous Microvascular Networks. IEEE Transactions on Visualization & Computer Graphics, (1), 1-1.

[2] Jiaming Guo, Keely A. Keller, **Pavel Govyadinov**, Paul Ruchhoeft, John H, Slater, Augmented, biomimetic microfluidic network to induce realistic flow in in vivo microvasculature, Analytical Methods, 2018 (in review)

[3] **Govyadinov, P.**, Turovets, S., Gunn, A., Tucker, D., & Luu, P. **(2017)**. Direct current conditioning to reduce the electrical impedance of the electrode to skin contact in physiological recording and stimulation. arXiv preprint arXiv:1711.01059.

[4] Jiaming Guo, Keely A. Keller, **Pavel Govyadinov**, Paul Ruchhoeft, John H, Slater, Augmented, biomimetic microfluidic network to induce realistic flow in in vivo microvasculature, Analytical Methods, 2018 (in review)

[5] **Govyadinov, P.**, Turovets, S., Gunn, A., Tucker, D., & Luu, P. **(2017)**. Direct current conditioning to reduce the electrical impedance of the electrode to skin contact in physiological recording and stimulation. arXiv preprint arXiv:1711.01059.

[6] **Govyadinov, Pavel A.**, and David Mayerich. "Automated GPU-Accelerated Segmentation of Volumetric Fiber Networks Using a Predictor-Corrector Algorithm." Microscopy and Microanalysis 22.S3 (2016): 1038-1039.

[7] **Govyadinov, P.**, Gunn, A., Turovets, S., Tucker, D., & Luu, P. **(2014)**. Iontophoretic conditioning of the electrode to skin contacts. In 15th Int Conf on Biomed App of Electrical Impedance Tomography (p. 36). Ontario: Systems and Computer Engineering, Carleton University.

[8] Song, J., Morgan, K., Turovets, S., Li, K., Davey, C., **Govyadinov, P**., ... & Tucker, D. M. **(2013)**. Anatomically accurate head models and their derivatives for dense array EEG source localization. Functional Neurology, Rehabilitation, and Ergonomics, 3(2/3), 275.

[9] Song, J., Turovets, S., **Govyadinov, P**., Mattson, C., Luu, P., Smith, K., ... & Tucker, D. M. **(2013)**. Anatomically accurate infant head models for EEG source localization. In Journal of Physics: Conference Series (Vol. 434, No. 1, p. 012012). IOP Publishing.

SELECTED SKILLS

Programming Language Proficiencies:

C/C++, C++/CUDA, Matlab, Wolfram Mathematica, Python, Java, Basic HTML/XML, SQL

Software Proficiencies:

Windows, Apple OS, Linux (preferred), Qt Creator, GTK, Amira, Anaconda, Photoshop/Gimp, NetStation

Library Proficiencies:

OpenMP, OpenMPI, MPICH I-II, CUDA, LaPACK, Boost, Tk, OpenGL, Network Programming using UDP and TCP/IP protocols

Spoken Language Fluency:

Russian

English