Niki Tavakoli

Ph.D. Student in Biomedical Engineering

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RESEARCH INTERESTS

Metabolic engineering, constraint-based modeling, computational science, mathematical oncology, machine learning

EDUCATION

Ph.D. - University of Southern California 05/2021 -
M.S. - University of Southern California 08/2019 - 05/2021
B.A. - University of California, Los Angeles 08/2014 - 06/2018

RESEARCH EXPERIENCE

Graduate Research Assistant 05/2021 -
University of Southern California, Viterbi School of Engineering
Los Angeles, CA
Advisor: Stacey D. Finley
Project: Constraint-based modeling of cancer & stromal cells
Funding: NIH U01 Grant, USC Graduate School Fellowship

Summer Researcher 06/2019 - 08/2019
Keck School of Medicine of USC
Los Angeles, CA
Dept. of Molecular Microbiology & Immunology
Project: data collection & database creation

TEACHING EXPERIENCE

Teaching Assistant & Course Producer 08/2020 - 05/2021
University of Southern California, Dept. of Biomedical Engineering
Los Angeles, CA
Courses:

- BME 513, Signals & Systems Analysis
- BME 415, Regulation of Medical Products

Assisted students during office hours in addition to grading problem sets and exams.

Student Instructor 01/2020 - 05/2021
USC Viterbi K-12 STEM Center
Los Angeles, CA
Instructing high school students in after-school programs within various subjects including Mathematics, Science and Engineering.

WORK EXPERIENCE

Data Science Intern 11/2019 - 05/2020
Leaf Group Ltd.
Santa Monica, CA
Developed SEO prediction models and COVID-19 visualization dashboards in Python for company brands.

Biofeedback Technician 06/2017 - 07/2018
Peak Brain Institute
Culver City, CA
Administered client electroencephalograms and helped clean data. Set up and ran client biofeedback sessions.

Clinical Intern 06/2016 - 11/2017
UCLA Ronald Reagan Medical Center
Los Angeles, CA
Assisted doctors and nurses with patient rounds and care in the ER, ICU and Oncology units.

HONORS & AWARDS

Scholarships & Fellowships:

- *PhysiCell Honorarium* (06/2021)
- *USC Annenberg Fellowship Top-Off* (02/2021)
- *USC Graduate Fellowship* (02/2021)
- *UCLA Regents Scholarship* (08/2016)
- *Freshman Academic Excellence Scholarship* (10/15)

Awards:

- *Ellison Institute Graduate Symposium Poster Award* (05/2022)
- *USC Viterbi M.S. Award for Academic Excellence & Service* (05/2021)
- *UCLA Care Extender Intern Award* (11/2017)

INVITED TALKS

- *ECMTB/SMB (Mathematical Oncology) Annual Conference* (09/22)
  Heidelberg, Germany
- *Ellison Institute Conference* (exp. Fall 22)
  Santa Monica, CA

SKILLS & LANGUAGES

Languages: Python (packages: Pandas, NumPy, Matplotlib, Seaborn, Sci-Kit Learn), MATLAB, C, bash
Web Dev: HTML5, CSS3, Ruby on Rails
Other: Git, LaTeX, openMP, CUDA, Slurm batch scheduler, Keras
Experience with: Metabolic flux analysis (openCOBRA), Machine Learning algorithms, parallel programming

RELEVANT & COURSEWORK

Graduate: Systems Biology, Molecular Biology of Cancer, Signals and Systems Analysis, Biomedical Imaging Informatics, Advanced Biomedical Systems, Scientific Computing and Visualization, Data Science at Scale, Database Systems
Undergraduate: General & Organic Chemistry, Cell & Molecular Biology, Genetics/Evolution/Ecology, Biochemistry, Multi-Variable Calculus, Calculus-Based Physics, Linear Algebra & Differential Equations, Statistics, Research Methods

PROJECTS

PhysiCell Microenvironment Cell Simulator *06/2021*
Worked in a 6 person team of engineers to develop an agent-based model extension of the PhysiCell software by using C++ to implement cell fibers in the extracellular matrix.
Github

Distributed Memory K-Clique Enumeration *12/2020*
Helped create a parallel algorithm for k-clique enumeration that can scale clique enumeration/counting on large-scale clusters using both shared and distributed memory parallelism in high performance computing.
Github

Prediction Model for Search Engine Optimization *12/2019*
Utilized the Google BigQuery API in Python to reduce over 10 million rows of data from MongoDB those those with the highest calculated potential to improve SEO of company's websites on Google. Trained data using a prediction model that ultimately resulted in quick and efficient content improvements.

LEADERSHIP

- **USC Viterbi Graduate Student Association** 01/20 - 03/20
  Biomedical Engineering Senator; collaborating to organize events and contribute to graduate studnet life at USC.
- **Convergent STEM (cSTEM)** 08/22 -
  Working with other STEM PhD students to organize events for students at the Michelson Center for Convergent Biosciences at USC.
- **USC Viterbi K-12 STEM Center** 08/19 -
  Student instructor for LAUSD after-school programs and student assistant.
- **Women in Science & Engineering (WiSE)** 01/20 -
  Member and graduate student mentor.

PROFESSIONAL SOCIETIES

- **Society of Mathematical Biology (SMB)**
  Member of Publications Committee.
- **Biomedical Engineering Society (BMES)**
  Member. Volunteer for BMES 2021 Organization.