

SHAWN GEOENG

Numerical Analysis, Computational Fluid Dynamics, Electrochemistry

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SUMMARY

Civil engineer experienced in Finite Element and Finite Volume Methods for structural analysis and fluid dynamics applications. Developed reactive flow models that accurately represent relevant physical and chemical processes within electrochemical systems to improve organic and/or inorganic contaminant removal efficiency and achieve optimum experimental design. Skilled in machine learning and data driven simulation.

EDUCATION

Northeastern University

Ph.D. Environmental and Geoenvironmental Engineering, GPA: 3.975

Expected Aug 2020

M.Sc. Geoenvironmental Engineering, GPA: 4.0

Aug 2016

University of Tehran

M.Sc. Environmental Engineering

Aug 2014

B.Sc. Civil Engineering

May 2013

TECHNICAL SKILLS

Computer Languages: MATLAB, Python, FORTRAN

Simulation Software: COMSOL Multiphysics, ANSYS Fluent, AutoCAD, ArcGIS

RESEARCH EXPERIENCE

Northeastern University

Sep 2014 – Present

Graduate Research Assistant, Computational Simulation

- Formulated electrochemical module in MATLAB to determine reaction rates at electrode surface; Validated model for time dependent pH variation throughout remediation process achieving 97% accuracy
- Created interface in MATLAB to exchange simulation data between chemical reaction software and electrochemical and transport modules in MATLAB; Validated reactive species transport model for inorganic contaminant
- Performed computational analysis on electrochemical batch reactor to increase production efficiency of hydrogen peroxide using carbon-based cathode; Demonstrated the effect of initial pH as a key parameter to increase hydrogen peroxide production
- Developed an electroanalysis model in COMSOL Multiphysics to obtain mechanistic information on oxygen reduction reaction on carbon based electrode using cyclic voltammetry

University of Tehran

Sep 2013 – Aug 2014

Graduate Research Assistant, Experimental Evaluation

- Designed experiments confirming effectiveness of electrocoagulation technique for low conductivity fluids by demonstrating influence of conductivity on system's efficiency at steady state condition
- Ascertained electrocoagulation removal efficiency for total nitrogen(TN), total phosphorus(TP), and chemical oxygen demand(COD); Found electrocoagulation efficient for TP and COD with 97% and 70% removal efficiencies, respectively
- Optimized treatment process for electrode material, formation, and sequence of electrodes to reach water reuse criteria limit

TEACHING EXPERIENCE

Northeastern University

Jan 2018 – present

Teaching Assistant, Soil Mechanics Lab

- Administered undergraduate soil mechanics lab sessions with 10+ students to conduct tests and advised students in 1:1 office hours to challenge and strengthen their analytical skills
- Demonstrated 7 fundamental and commonly used soil mechanics tests according to ASTM standards for students as soil characteristics assessment tool at construction sites
- Delivered presentations on soil mechanics for each lab session emphasizing practical application of theory
- Evaluated lab reports for 45-50 students per semester and provided fair assessment and feedback to improve students' report writing skills

University of Tehran

Jan 2013 – May 2013

Teaching Assistant, Introduction to Finite Element Method

- Delivered recitation classes with more focus on computer programming for 20+ students
- Guided and evaluated students on defining, executing, and analyzing structural analysis projects worth 40% of overall course grade
- Led 1:1 office hours to work closely with students to strengthen programming skills

PUBLICATIONS

Geoeng, S., et al. rnoi iTeehtralco iendoucr by roteedlsce mgdeoln iummhrco aevhnealxt fo ltairceecohemcl ssecpseo wiht, (in progress).

Shen, J., ..., & **Geoeng, S.**, Alsha, N. A., (2019). eavmrlo tamlorfp A outbsr ctatnsnoniam rniogca uohgftorwlh- rfo, *Nature Sustainability*, (under review).

Lhen, C., Lajic, R., Yhao, Z., Ketrick, H., **Geoeng, S.**, Alsha, N. A., ... & Who, Z. (2018). wthi ceimEoclcIhetar nmeoieidaRt lonEviretnamn sehoeinlgToc. itOkhrr-emK *Encyclopedia of liCmcaeh cIngeyohTo*, 13-98.

Geoeng, S., Lajic, R., & Alsha, N. A. (2018). rebiasrr fro mloed iretaecv enTtransi yb eeccmrtelcoalih cylshacceiopmhi tronatprs eeivartc trrmaontinfosa. *Journal ahosrduza aliesatmr fo*, 35, 17-77.

ACADEMIC PROJECTS AND LEADERSHIP

Machine Learning Project

Sep 2019 – Dec 2019

Multimodal Dataset for Wearable Stress and Affect Detection

- Applied Recurrent Neural Network on WESAD database from UCI Machine Learning Repository to evaluate performance of deep learning networks on affection detection using physiological signals in which 80% accuracy was obtained

Webinar Organizer, Northeastern University

Nov 2018

PROTECT Center Training Core, NIH/NIEH funded research center

- Organized professional development webinar on CV/Resume building for 40+ multidisciplinary and multi-institutional PROTECT center graduate student trainees in 5 separate locations

Research Mentor, College of Engineering, Northeastern University

Jun 2016 – Aug 2017

Research Experience for Undergraduates (REU), NSF funded program

- Guided students to define and approach a research question; Mentored students to develop and verify a transient model to simulate pH variation during electrochemical remediation process; Students successfully presented two posters at North East Graduate Student Water Symposium (NEGSWS) 2016 and 2017