# Shuai Wang

Tel: +86 19953217357 | Email: shuaiwang981108@gmail.com | Address: Shenzhen, China
ORCID: 0000-0002-6181-1371 | Google Scholar: https://scholar.google.com/Shuai Wang

## Education Background

**Southern University of Science and Technology**, Shenzhen, China 09/2021–present

- **Master of Science**, Biology, School of Environmental Science and Engineering
  GPA: 3.75/4.0 (credits: 28)

**Southern University of Science and Technology**, Shenzhen, China 09/2017–06/2021

- **Bachelor of Engineering**, Environmental Science and Engineering, School of Environmental Science and Engineering
  GPA: 3.61/4.0 (credits: 160)

## Academic Achievements

### Publications with peer-reviewed

- **Wang, S.**, Zhu, H., Zheng, G., Dong, F., & Liu, C. (2022). Dynamic Changes in Biofilm Structures under Dynamic Flow Conditions. *Applied and Environmental Microbiology*, 88(22), e01072-01022. https://doi.org/doi:10.1128/aem.01072-22
- **Wang, S.**, Zhu, H., Zhang, C., Ye, Y., Zhang, R., Wang, X., & Liu, C. (2023). Microscopic insights into the variations of antibiotics sorption to clay minerals. *Ecotoxicology and Environmental Safety, 258,* 114970. https://doi.org/10.1016/j.ecoenv.2023.114970
- Chen, Y.; Feng, J.; Wang, X.; Zhang, C.; Ke, D.; Zhu, H.; **Wang, S.**; Suo, H.; Liu, C. (2023). An Iterative Approach of Experiment-Machine Learning for Efficient Optimization of Environmental Catalysts: An Example of NOx Selective Reduction Catalysts. *Environemntal Science & Technology*. https://doi.org/10.1021/acs.est.3c00293
- Zhu, H., **Wang, S.**, Gao, K., & Liu, C. (2023). Cross-scale models for iron oxides bioreduction rates. Journal of Hydrology, 624, 129976. https://doi.org/10.1016/j.jhydrol.2023.129976

### Manuscripts under Review

- **Wang, S.**; Zhu, H.; Zhang, R.; Li, Z.; Wang, X., Single-cell-resolution analysis revealing hydrodynamics and morphology effect on biofilm detachment. Submitted to *Science of the Total Environment* in May 2023. Under review.

### Manuscripts in Preparing

- **Wang, S.**; Zhu, H.; Ke, D.; Gao, K.; Liu, C., Hydrodynamics and Hydrochemical Effects on Ferrihydrite Bioreduction with *Shewanella Oneidensis* MR-1 Biofilms.
- **Wang, S.**; Zhu, H.; Gao, K.; Liu, C., Kinetics of Ferrihydrite Reduction in a Biofilm System.
- Zhang, C.*; **Wang, S.***; Suo, H.; Liu, C., Effects of Flow-Interruption on the Transport of Tetracycline in Porous Media. (‘*’ contribution equally)

## Conference

- Shuai Wang and Chongxuan Liu, Insights on the variations of antibiotics sorption to mineral surfaces from molecular dynamics simulations. The 11th National Conference on Environmental Chemistry, Harbin, China, poster, 07/2022
- Shuai Wang and Chongxuan Liu, Hydrodynamics affected biofilm function in iron(III) reduction. ACS Fall 2023 National meeting, oral presentation.
- Shuai Wang and Chongxuan Liu, Biofilm kinetics of ferrihydrite reduction. ACS Fall 2023 National meeting, poster.

## Research Experience

**Southern University of Science and Technology**, Shenzhen, China 03/2019–present
Supervised by Prof. Chongxuan Liu (Chair Professor)

1. The dynamics of iron and pollutant hydrobiogeochemistry in the hyporheic zone:

- Dynamic analysis of biofilm reduction kinetics of ferrihydrite. A comprehensive biofilm reduction model was developed and explain the rate differences caused by the biofilm thickness in iron reduction and transformation.
- Investigating hydrodynamics and hydrochemical effects on biofilm function in iron biogeochemical cycles. The research focuses on the interaction between iron bioreduction with biofilm and transport in the water-sediment interface. A reactive transport model which coupled reduction kinetics and detachment kinetics was developed.
- Upscaling iron bioreduction rates with ML approaches.
- Reactive transport experiments and modeling of antibiotics in porous media. The research highlights the impact of flow interruption on adsorption and transport in porous media.

2. The co-evolution of microbial biofilm function and hydrobiogeochemical processes:

- Investigating the influence of hydrodynamics on biofilm 3D microstructures and biofilm response to complex dynamic flows. A universal biofilm detachment model was established in this study.
- Utilizing CFD and ML approaches to unravel the mechanisms of biofilm detachment under complex environmental factors.

3. Molecular-scale interfacial adsorption for environmental contaminant removal:

- Gaining microscopic insights into the adsorption of antibiotics with clay minerals. The research employed macro-scale adsorption experiments and micro-scale molecular dynamics simulations to unravel the surface mechanisms.

**S.S. Papadopulos & Associates, Inc.**, Washingtong DC, USA
Visiting student with Charles Andrews (Senior Principal) 08/2019

- Soil and groundwater contamination and remediation

## Others

- **Software**: Gromacs; COMSOL-Multiphysics; BiofilmQ; Gaussian; Python; MATLAB
- **Experimental Instrument**: CLSM, UV-Vis; XRD; HPLC; Flow Cytometry; ICP-OES; FTIR; SEM-EDS; XPS; IC; TEM; AFM; EES.