Weiliang Bai

Civil, Architectural and Environmental Engineering, University of Texas at Austin

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EDUCATION

Civil, Architectural and Environmental Engineering, University of Texas at Austin	Aug 2019 – Present
Doctoral of Philosophy in Environmental and Water Resource Engineering	
Civil and Environmental Engineering, Carnegie Mellon University	Aug 2017 - Dec 2018
Master. in Environmental Engineering, GPA: 3.97/4.0	
School of Environment, Tsinghua University	Aug 2013 - Jul 2017
B.E. in Environmental Engineering, GPA: 3.38 /4.0	

FELLOWSHIPS AND HONORS

- NWRI/American Membrane Technology Associations (AMTA) Fellowship (2021)
- Fellowship of Graduated Research Assistance at Civil, Architectural and Environmental Engineering in University of Texas at Austin (2019 - Present)
- Civil Engineering Scholarship at Carnegie Mellon University (2017-2018)
- Fellowship of Graders at Carnegie Mellon University (2018)
- Literature and Art Scholarship of Tsinghua University (2015, 2016)

PUBLICATIONS

- **Weiliang Bai,** Laxmicharan Samineni, Progga Chirontoni, Igor Krupa, Peter Kasak, Anton Poelka, Navid B. Saleh, Manish Kumar. "Quantifying and Reducing Concentration Polarization in Reverse Osmosis Systems." Desalination (2023) (accepted).
- **Weiliang Bai,** Ruizhe Xu, Daniel King, Adam Boehnke, Navid B. Saleh, Manish Kumar. "Dissolved Silica Antifouling and Concentration Polarization Reduction in Reverse Osmosis Filtration by Oxygen Bubbles Enhanced Mixing" (in progress)
- **Weiliang Bai,** Mircea Podar, Cynthia M. Swift, Jacques Mathieu, Frank E. Löffler, Pedro J.J. Alvarez, Navid B. Saleh, Manish Kumar. "Home RO filters can serve as passive samplers to assess presence and diversity of microorganisms in distribution systems" (in progress).
- Podar, Mircea, Amanda L. May, **Weiliang Bai**, Kellie Peyton, Dawn M. Klingeman, Cynthia M. Swift, Devan AF Linson et al. "Microbial diversity analysis of two full-scale seawater desalination treatment trains provides insights into detrimental biofilm formation." Journal of Membrane Science Letters 1, no. 1 (2021): 100001.
- Xu, Jiang, Yan Wang, Cindy Weng, **Weiliang Bai**, Yang Jiao, Ralf Kaegi, and Gregory V. Lowry. "Reactivity, Selectivity, and Long-term Performance of Sulfidized Nanoscale Zerovalent Iron with Different Properties." Environmental science & technology (2019).
- Xu, Jiang, Xue Liu, Zhen Cao, **Weiliang Bai**, Qingyang Shi, and Yi Yang. "Fast degradation, large capacity, and high electron efficiency of chloramphenicol removal by different carbon-supported nanoscale zerovalent iron." Journal of hazardous materials 384 (2020): 121253.
- Fu, Jing, Xiaomao Wang, **Weiliang Bai**, Hongwei Yang, and Yuefeng F. Xie. "Azo compound degradation kinetics and halonitromethane formation kinetics during chlorination." Chemosphere 174 (2017): 110-116.

CONFERENCE PRESENTATIONS

- Reactive Reverse Osmosis Membranes for Dissolved Silica Antifouling and Concentration Polarization Reduction by Generating Oxygen Bubbles, **North American Membrane Society (NAMS)**, 31st Annual Meeting, Tempe, AZ, USA, May 2022 (Oral & Poster Presentation).
- Comprehensive OMICS Platform for Dynamic Characterization of RO Biofouling, **AMTA/AWWA Membrane Technology Conference & Exposition**, Knoxville, TN, USA, Feb 2023 (Oral Presentation).
- Active Reverse Osmosis Membranes for Antifouling and Concentration Polarization Reduction by Generating In Situ Oxygen Bubbles, **Golden Research Conference, Membranes: Materials and Processes**, New London, NH, USA, Aug 2022 (Poster Presentation).
- Nanoparticle enabled reactive membranes to prevent fouling by generating in situ microbubbles, **Sustainable Nanotechnology Organization (SNO)**, Online, Nov 2020 (Poster Presentation).
- Reactive Membrane to prevent fouling by generating in-situ microbubbles, **North American Membrane Society (NAMS)**, 29th Annual Meeting, Online, May 2020 (Poster Presentation).

TEACHING EXPERIENCE

- Teaching Assistant, Design Wastewater/Water Treatment Faciles, Civil Architectural and Environmental Engineering, The University of Texas at Austin, Sp 2020 – 2023.
- Grader, Water and Wastewater Treatment Engineering, Civil Architectural and Environmental Engineering, The University of Texas at Austin, Sp 2022.

INTERN EXPERIENCE

National Renewable Energy Laboratory (NREL) | Research Assistant | Golden, CO, USA   Jul 2022 – Dec 2022
Advisor: Dr. Abhishek Roy and Dr. Mou Paul

- Design and set up of lab-scale reverse osmosis filtration cells.
- Hand-casting polyamide active reverse osmosis membrane layer by interfacial polymerization of m-phenylenediamine (MPD) and trimesoyl chloride (TMC) on polysulfone supporting layers.
- Dissolved polysulfone in N-Methyl-2-pyrrolidone (NMP) at the cloud point and cast the polysulfone support membrane layers.

Chinese Academy of Agricultural Sciences | Research Assistance | Beijing   Mar 2019 – Jul 2019
Advisor: Dr. Ligang Wang

- Detected the nitrogen, methane and carbon dioxide emission in growth of corn and oilseed rape in planting and harvest season
- Used model to calculate greenhouse gas emission in large scale for cereal and vegetables growing

Guohuan Tsinghua Environment Engineering Design & Research Institute | Engineer | Beijing   Mar 2014 – Jun 2014

- Resolved issues at two sewage treatment plants with excessive ammoniacal nitrogen in the effluent using breakpoint chlorination treatment and A/O process for the plant.
- Designed and drew ichnographies of sewage treatment plants by auto CAD, including a coarse screen and a pumping station.
- Compared the efficiency and economic effect of lime neutralization process and recovery method of villiaumite in industrial wastewater.

RESEARCH EXPERIENCE

Ph.D Degree, University of Texas at Austin, Advisor: Dr. Navid Saleh and Dr. Manish Kumar   Sep 2019 - Present

- Coating polydopamine and manganeses dioxide on thin-film composite membrane to produce microbubbles by injecting hydrogen peroxide during filtration process for antifouling and concentration polarization reduction.
- Monitoring the biofilm transformation by an omics platform in both lab-scale reverse osmosis cells, large-scale reverse osmosis facilities, and home-used reverse osmosis filter.
- Review of concentratration polarization monitoring techniques and reduction methods by injecting external energy during the filtration process.

Master Degree, Carnegie Mellon University, Advisor: Dr. Gregory Lowry   Sep 2017 – Dec 2018

- Synthesis and characterization of sulfidated nano zerovalent iron (S-nZVI) by dropwise method in glove box.
- Testing the reaction kinetics of S-nZVI with water, nitrate and trichloroethylene (TCE).
- Exploring the methods of using electrochemical to degrade Per- /Polyfluoroalkyl Substances(PFAS) and Perfluorooctane sulfonic acid (PFOS).

Bachelor Degree, Tsinghua University, Advisor: Dr. Yuefeng Xie and Dr. Xiaomao Wang   Mar 2016 – May 2017

- Conducted experiments on the degradation rate of chlorine in the organic dyes at different pH values.
- Identified the residual chlorine in highly concentrated organic water after the technological process of drinking water treatment.