Mai Pham

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AGRICULTURAL AND BIOENVIRONMENTAL ENGINEER

Accomplished and focused professional with demonstrated expertise in developing and modeling physical, chemical and biological water/wastewater treatment processes for removing natural organic matter, emerging contaminants, and toxicity. Comprehensive knowledge and experiences in the field of bioenergy production from bio-waste. Recognized for professionalism, commitment to excellence and ability to handle multiple projects and meet deadlines under pressure. Self-motivated and able to work independently or in a team. Proficient in MS Office (Word, Excel, PowerPoint, MS Project), MatLab, R Project, SigmaPlot, Origin Pro, STELLA. Bilingual and bi-literate in English and Vietnamese languages.

EDUCATION

University of Illinois at Urbana-Champaign, Urbana, IL

- Ph.D., Agricultural and Biological Engineering, December, 2013: Bioenvironmental Engineering
  - **Thesis**: Characterizing the Effects of Hydrothermal Processes on Bio-active Compounds in Wastewater Bio-energy Systems
  - **Advisor:** Professor Lance Schideman
- M.S., Civil and Environmental Engineering, August, 2009: Water Quality Process Engineering
  - **Thesis**: Deposition Kinetics of Bacteriophage MS2 to Natural Organic Matter: Role of Divalent Cations
  - **Advisor:** Professor Helen Nguyen

Vietnam National University, Hanoi, Vietnam

- B.S., Environmental Science, 2005: Environmental Management
  - Graduated with Honors: top 2/87

HONORS AND AWARDS

- Vietnam Education Foundation Fellowship for Graduate Study in the US, 2007-2009
- Representative at Conference of Young Scientists at Vietnam National University, 2005
- Annual Vietnamese Government Scholarship for Outstanding Undergraduate Students, 2001-2005
- First prize, Vietnam National University Undergraduate Student Research Competition, 2004
- Second prize, Vietnam Ministry of Education and Training Undergraduate Student Research Competition, 2004

RESEARCH INTERESTS

- Monitoring and modeling the fate and transport of emerging contaminants in wastewater and agricultural systems
- Bio-energy recovery from human, animal and food waste streams
- Integrated wastewater-bioenergy production system
- Effects of waste-to-energy processes such as hydrothermal liquefaction and catalytic hydrothermal gasification on the fate of chemicals of emerging concern (CECs) in biowastes
- Environmental impacts of waste to energy processes
- Water and wastewater treatment processes focusing on:
  - Algal-based wastewater treatment systems
  - Granular activated carbon for water/wastewater treatment
  - Catalytic hydrothermal gasification of wastewater
- Interfacial behavior of viruses in natural environment for controlling of emerging waterborne pathogens for a sustainable water supply

- Interactions of bacteriophage MS2 with surfaces coated with natural organic matter: Role of solution compositions

PROFESSIONAL EXPERIENCES

University of Illinois at Urbana-Champaign, Department of Agricultural and Biological Engineering

- Postdoctoral research associate in Bioenvironmental Engineering Division, actively worked on the project "*Characterizing the fate and transport of chemicals of emerging concern (CECs) from animal manures during waste to energy processes*"; **January 2014-June 2015**
  - Develop and validate a dynamic process model describing the fate, transport, and transformation of chemical of emerging concerns in animal manure through an integrated wastewater treatment and bioenergy production process
- Research assistant in Bioenvironmental Engineering Division, actively worked on the project "*Characterizing Effects of Hydrothermal Liquefaction Bioenergy Production Process on Emerging Contaminants and Wastewater Reuse Potential*"; **2011-2013**
  - Modeling the fate and transport of emerging contaminants in wastewater stream
  - Conducted hydrothermal liquefaction of wet biomass (animal waste, algae, and activated sludge) to produce renewable bio-crude oil
  - Characterized the wastewater generated from hydrothermal liquefaction of wet biomass
  - Evaluated toxicity effect of hydrothermal liquefaction wastewater on mammalian cells and algal growth
  - Developed and evaluated the use of algal bioreactors, activated carbon adsorption, and catalytic gasification to improve chemical and biological quality of hydrothermal liquefaction wastewater
- Research assistant in Bioenvironmental Engineering Division, actively worked on the project "*Evaluating Granular Activated Carbon Filter Caps for Control of Multiple Organic Compounds*"; **2009-2011**
  - Developed and evaluated predictive modeling tools to predict removal of trace contaminants and natural organic matter by granular activated carbon filter caps
  - Performed bench-scale and pilot scale granular activated carbon column experiments to remove emerging contaminants and natural organic matter in natural water
  - Conducted bench-scale testing to evaluate the reduction of natural organic matter preloading effect by novel granular activated carbon adsorbents

University of Illinois at Urbana-Champaign, Department of Civil and Environmental Engineering

- Research Assistant in Newmark Civil Engineering Laboratory, actively worked on the project *"Characterizing the Interfacial Behavior of MS2 Bacteriophage in Natural Environment"*; **2007-2009**
  - Cultured, purified viruses, and characterized surface properties of bacteriophage MS2 using Dynamic Light Scattering (DLS) technique
  - Investigated fate and transport of bacteriophage MS2 in natural environment using Quartz Crystal Microbalance with Dissipation (QCM-D)

Vietnam National University, Hanoi, Vietnam

- Research Assistant at Center of Environmental Modeling and Monitoring, Department of Environmental Science , worked on the project "*Apply Turbulent Diffusion Models of Pollutants to Estimate Suitable Height of Factory Chimneys*"; **2003-2005**
  - Collected data of air pollutants from weather stations in Hanoi, Vietnam
  - Developed and tested turbulent diffusion models to predict the concentration of air pollutants from industrial factories in Hanoi, Vietnam

TEACHING AND MENTORING EXPERIENCES

University of Illinois at Urbana-Champaign, Department of Agricultural and Biological Engineering

- Teaching assistant for ABE/TSM 430, *"Project Management",* **Fall 2012**

- Authored and delivered lecture material; developed and evaluated homework assignments
- Teaching assistant for TSM 372, "*Environmental Control and HVAC Systems*", **Fall 2011**
  - Delivered lab material and instructed lab experiments; evaluated homework assignments
- Teaching assistant for ABE 141, "*ABE Principles: Biological"*, **Spring 2011**
  - Delivered lab material and instructed lab experiments; evaluated homework assignments
- Mentoring as a PhD Student:
  - One Master Student: Bridge Cameron, **2010-2011**
  - Two Undergraduate Students: Alexandra Breban, **2008-2009**; Randy Leibowitz, **2012-Current**

Vietnam Forestry University, Hanoi, Vietnam

- Lecturer in "*Introduction to Environmental Science",* **2005-2006**
  - Authored and delivered lecture material
  - Developed and evaluated homework assignments and exams

PUBLICATIONS

- **Pham, M**., Schideman,L., Chao, G., Shin, Y., Sharma B.K, Zhang, Y., Plewa, M.J., 2013. Effects of Operating Conditions on the Quality of Wastewater Generated from Hydrothermal Liquefaction of *Chlorella pyrenoidosa.* Environmental Science & Technology (In preparation)
- **Pham, M**., Schideman, L., Sharma B.K., Zhang Y., 2014. Removal of Bioactive Contaminants from Wastewater by Hydrothermal Liquefaction Processes. Proceedings of the Water Environment Federation, Energy and Water 2014 (In print).
- **Pham, M**., Schideman, L., Sharma B.K., Zhang Y., 2013. Effects of Hydrothermal Liquefaction on the Fate of Bioactive Contaminants in Manure and Algal Feedstocks. Bioresource Technology 149, 126-135.
- **Pham, M**., Schideman, L., Scott, J., Rajagopalan, N., Plewa, M.J., 2013. Chemical and Biological Characterization of Wastewater Generated from Hydrothermal Liquefaction of *Spirulina*. Environmental Science & Technology 47, 2131-2138.
- Zhou, Y., Schideman, L., Zhang, Y., Yu, G., Wang, Z**., Pham, M**., 2011. Resolving Bottlenecks in Current Algal Wastewater Treatment Paradigms: A Synergistic Combination of Low-Lipid Algal Wastewater Treatment and Hydrothermal Liquefaction for Large-Scale Biofuel Production. Proceedings of the Water Environment Federation 2011, 347-361.
- **Pham, M**., Mintz, E.A., Nguyen, T.H., 2009. Deposition Kinetics of Bacteriophage MS2 to Natural Organic Matter: Role of Divalent Cations. Journal of Colloid and Interface Science 338, 1-9.
- Yuan, B., **Pham, M**., Nguyen, T.H., 2008. Deposition kinetics of bacteriophage MS2 on a silica surface coated with natural organic matter in a radial stagnation point flow cell. Environmental Science & Technology 42, 7628-7633.

PRESENTATIONS (*indicates presenter)

- **Mai Pham***, Lance Schideman. "*Characterizing the Effect of Hydrothermal Processes on Bioactive Compounds in Wastewater Bioenergy System*". Oral Presentation. Department of Biology, Brooklyn College. March 04 2014. Brooklyn, New York, USA.
- **Mai Pham***, B.K. Sharma, Michael Plewa, Lance Schideman. "*Characterizing the Effect of Hydrothermal Liquefaction on Fate and Transport of Bioactive Compounds in Animal Waste*". Oral presentation. ASABE Annual International Meeting. July 21-24, 2013. Kansas City, Missouri USA.
- **Mai Pham***, Lance Schideman. "*Chemical and Biological Characterization of Wastewater from Hydrothermal Liquefaction Conversion of Biomass to Biofuels*". Oral Presentation. Bioenvironmental Engineering Meeting. February 20 2013. Urbana, Illinois, USA.
- **Mai Pham***, Lance Schideman. "*Characterizing Effects of Hydrothermal Liquefaction Bioenergy Production Process on Emerging Contaminants and Wastewater Reuse Potential*". Oral presentation. ASABE Annual International Meeting. July 29-August 1 2012. Dallas, Texas, USA.

- **Mai Pham**[*], Lance Schideman. "*Evaluating Granular Activated Carbon Filter Caps for Control of Disinfection By-product Precursors*". Oral Presentation. Bioenvironmental Engineering Meeting. February 22 2010. Urbana, Illinois, USA.
- **Mai Pham**[*], Lance Schideman. "*Destruction of Antibiotic Resistant Genes and Emerging Contaminants via a Hydrothermal Liquefaction Process*". Oral Presentation. Bioenvironmental Engineering Meeting. October 22 2010. Urbana, Illinois, USA.
- **Mai Pham**[*], Thanh H.(Helen) Nguyen. "*Role of Divalent Cations in the Deposition Kinetics of MS2 Virus to Natural Organic Matter*". Oral Presentation. WaterCAMPWS National Science Foundation Site Visit. June 3-4, 2009. Urbana, Illinois, USA.
- **Mai Pham**[*], Thanh H.(Helen) Nguyen. "*Deposition Kinetics of Bacteriophage MS2 to Natural Organic Matter: Role of Divalent Cations"*. Poster Presentation. MRS Annual International Meeting. April 13-19, 2009. San Francisco, California, USA.
- **Mai Pham**[*], Thanh H.(Helen) Nguyen. "*Deposition Kinetics of Bacteriophage MS2 on a Silica Surface Coated with Natural Organic Matter in the Presence of Divalent Cations*". Oral Presentation. Environmental Engineering Science Symposium. April 8 2008. Urbana, Illinois, USA.

GRANTS AND FUNDING

- **Characterizing the Fate and Transport of Chemicals of Emerging Concern (CECs) from Animal Manures during Waste to Energy Processes (2013-2016)**
  - Funding Agency: United States Department of Agriculture
  - Total Funding: $500,000
  - Role: Grant writing, researcher. PI. Co PIs: Prof. Lance Schideman, Prof. Yuanhui Zhang, Dr. B.K. Sharma; Prof. Michael Plewa
- **Characterizing the Effects of Thermochemical Bioenergy Production Process on Emerging Contaminants and Wastewater Reuse Potential (2011-2012)**
  - Funding Agency: Illinois Sustainable Technology Center; University of Illinois at Urbana-Champaign
  - Total Funding: $25,000
  - Role: Grant writing, researcher. PI. Co PIs: Prof. Yuanhui Zhang, Prof. Lance Schideman, Dr. B.K. Sharma

TECHNICAL SKILLS

- **Analysis Technique:** Total Organic Carbon (TOC), Chemical Oxygen Demand (COD), Total Trihalomethanes (TTHMs); High Performance Liquid Chromatography (HPLC), UV/Visible Spectrophotometer, Dynamic Light Scattering, Quazt microbalance with dissipation, Liquid Scintillation Counter, Solid phase extraction; Liquid-Liquid phase extraction,
- **Technical Skill:** Hydrothermal liquefaction and catalytic hydrothermal gasification; Aseptic techniques and molecular biology (e.g., RNA/DNA extraction/purification, DNA electrophoresis and DNA transformation); Virus, mammalian cell and algae culture; *In vitro* toxicology assays; Aerobic batch and continuous algal bioreactors; Bench scale and pilot scale granular activated carbon column operation.

REFERENCES

- Professor Lance Schideman (Ph.D. Advisor), Department of Agricultural and Biological Engineering, University of Illinois at Urbana-Champaign (Email: schidema@illinois.edu; Phone: 217-244-8485)
- Professor Michael Plewa, Department of Crop Science, University of Illinois at Urbana-Champaign (Email: mplewa@illinois.edu; Phone: 217-333-3614)
- Professor Helen Nguyen (M.S. Advisor), Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign (Email: thn@illinois.edu; Phone: 217-244-5965)