Longwen Ou

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Education

- **Iowa State University** — Ames, IA
  Ph.D., Mechanical Engineering (GPA: 4.0 / 4.0) — *2011 - 2016*
  Co-major: Biorenewable Resource and Technology

- **Huazhong University of Science and Technology** — Wuhan, China
  B.Sc., Mechanical Engineering — *2007 - 2011*

Research Experience

- **National Renewable Energy Laboratory (NREL)** — Golden, CO
  Visiting Postdoctoral Researcher — *Sep. 2017 - Dec. 2017*
  - Performed statistical analysis of the EPAct/V2/E-89 dataset to corroborate that blended ethanol does not increase PM emission from gasoline combustion.
  - Implemented a machine learning pipeline to accelerate high-throughput screening of zeolite catalysts for dehydrogenation of isobutane.

- **North Carolina State University** — Raleigh, NC
  Postdoctoral Researcher — *Sep. 2016 - Present*
  - Developed a fast pyrolysis process model with Aspen Plus that is sensitive to biomass feedstock composition.
  - Analyzed product yields, energy consumption, and economics of hydrocarbon production from fast pyrolysis with various biomass feedstocks.
  - Conducted process modeling and economic analysis for biosugar production from lignocellulosic feedstock with mechanical refining.
  - Performed uncertainty quantification of biomass blending in biorefinery supply chain design.
  - Optimized blending ratios for different biomass combinations for minimized delivered biomass costs and minimized uncertainties in the delivered biomass costs.

- **Iowa State University** — Ames, IA
  Graduate Research Assistant — *Sep. 2011 - May. 2016*
  - Developed process models for various bioenergy systems with ChemCAD.
  - Performed life cycle inventory analysis of power production from fast pyrolysis heavy-end bio-oil.
  - Performed geospatial environmental assessment of power generation from fast pyrolysis heavy-end bio-oil.
  - Wrote Python programs for data preprocessing, geographic analysis of emission sources, allocation and visualization of emissions.

Home Projects

- **Kaggle competition: House Prices: Advanced Regression Techniques (ranked top 13% on leaderboard among >1600 teams).**
  - Conducted exploratory data analysis of the training dataset consisting of 1460 samples and 79 features to identify important features and outliers.
  - Performed data preprocessing and feature engineering (imputing missing values, standardizing numerical features, log-transformation of skewed features) to reduce RMSE.
  - Used nested cross-validation to tune hyperparameters and measure performances of multiple machine learning algorithms (ridge regression, LASSO, xgboost, gradient boosting regression).
  - Reduced RMSE further by 5% with stacked generalization.
- **Google Scholar Crawler.**
  - Built a google scholar crawler with Python and the Scrapy library to extract tiles and authors of all the publications by a specified author and all the publications citing this author.

Skills

- **Life cycle analysis:** GREET
- **Process modeling:** Aspen Plus, ChemCAD
- **Programming:**
  - Proficient in Python (3 years experience)
  - Other: MATLAB, SQL, C++, git
- **Analytical skills:**
  - 2 years experience of data exploration, modeling, and visualization with the Python data stack (numpy, pandas, scipy, scikit-learn, matplotlib, seaborn, etc.)
  - Mathematical modeling, uncertainty quantification, linear and nonlinear programming, statistical analysis, machine learning, data analysis and visualization

Teaching Experience

- **ME 335L Fluid Flow Lab** Spring 2016
  - Instructed students in lab procedures
  - Graded pre-lab problems and lab reports
- **ME 436 Heat Transfer** Fall 2015
  - Graded assignments and exams

Awards

- China National Endeavor Scholarship 2009, 2007
- China National Merit Scholarship 2008
- Outstanding Academic Performance Award, Huazhong University of Science & Technology 2008
- Excellent Freshmen Award, Huazhong University of Science & Technology 2007

Publications

- **Ou, L.**, Hoyong Kim, Stephen Kelley, Sunkyu Park (2018). Impacts of Feedstock Properties on the Process Economics of Fast Pyrolysis Biorefineries. *Biofuels, Bioproducts and Biorefining.*
- **Ou, L.**, Li, B., Dang, Q., Jones, S., Brown, R., Wright, M. M. (2016). Understanding Uncertainties in the Economic Feasibility of Transportation Fuel Production using Biomass Gasification and Mixed Alcohol Synthesis. *Energy Technology.*
- Li, B., **Ou, L.**, Dang, Q., Meyer, P., Jones, S., Brown, R., Wright, M. (2015). Techno-economic and uncertainty analysis of in situ and ex situ fast pyrolysis for biofuel production. *Bioresource technology.*
- Wang, K., **Ou, L.**, Brown, T., Brown, R. C. (2015). Beyond ethanol: a techno-economic analysis of an integrated corn biorefinery for the production of hydrocarbon fuels and chemicals. *Biofuels, Bioproducts and Biorefining.*
- **Ou, L.**, Thilakaratne, R., Brown, R. C., Wright, M. M. (2015). Techno-economic analysis of transportation fuels from defatted microalgae via hydrothermal liquefaction and hydroprocessing. *Biomass and Bioenergy.*
- **Ou, L.**, Brown, T. R., Thilakaratne, R., Hu, G., Brown, R. C. (2014). Techno-economic analysis of co-located corn grain and corn stover ethanol plants. *Biofuels, Bioproducts and Biorefining.*

Presentations

- Understanding uncertainty of transportation fuel production via biomass gasification and mixed alcohol synthesis, *poster presented at TCBiomass2015, Chicago, IL USA, November, 2015.*
- Techno-economic Analysis of Defatted Microalgae Hydrothermal Liquefaction Followed by Bio-crude Upgrading, *poster presented at TCS2014, Denver, CO, USA, September, 2014.*
- Optimal design and operation of combined first and second generation ethanol plant, *oral presentation at INFORMS Annual Meeting, Minneapolis, MN, USA, October 2013.*
- Techno-Economic Analysis of the Production of Hydrocarbons from Pyrolytic Sugars, *poster presented at TCBiomass2013, Chicago, IL, USA, September, 2013.*