

Muhammad Tahir Ashraf

PH.D. CHEMICAL ENGINEERING · PROCESS ENGINEER · DATA SCIENTIST

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Experience

Masdar Institute

Abu Dhabi, UAE

PH.D. RESEARCH

Jan. 2014 – Dec. 2017

- Worked with a multidisciplinary team from Masdar and MIT to assess biorefinery feasibility in an arid under the collaborative project: "Biorefinery: Integrated Sustainable Processes for Biomass Conversion to Biomaterial, Biofuels and Fertilizer".
- Proposed and evaluated use of multi-feedstock lingo-cellulose for envisioning a biorefinery in arid regions like the UAE, results are published in *Bioresource Technology*.
- Carried out process simulation and techno-economic assessment of multi-feedstock pretreatment for the prospective biorefinery, results are published in *Bioresource Technology*.
- Developed process simulation and economic assessment models for various sections of the biorefinery process using Aspen Plus®, SuperPro® Designer, and MATLAB®.

Massachusetts Institute of Technology (MIT)

Boston, USA

ADVANCED STUDY PROGRAM & RESEARCH

Sep. 2015 – Jan. 2016

- Developed and implemented a mathematical framework to optimize the biorefinery network, results are published in *Comput. Aided Chem. Eng.*

Freelance at Upwork

Online

PROCESS ENGINEER & DATA SCIENTIST

Aug. 2013 – Present

- 100% job success rate after working with 14 clients and for 1100+ hours.
- Developed design and rating tools natural gas grid heating application while working as lead process engineer for ProHeat Systems Ltd.
- Technology consultant for the Inventix Inc. USA, for the municipal solid waste to power project.

American University of Sharjah (AUS)

Sharjah, UAE

M.SC. RESEARCH & GRADUATE TEACHING ASSISTANT

Sep. 2011 – Jul. 2013

- Design and optimized p-xylene production from toluene, results are published in *I&ECR*.
- Optimization of refrigeration cycle for the liquified natural gas (LNG), results are published in *Energy Technology*.
- Conducted tutorials and labs training for the undergraduate students while working part time as graduate teaching assistant in the Department of Chemical Engineering, AUS.

Lotte Chemicals Pakistan Ltd.

Karachi, Pakistan

PROCESS ENGINEER

Aug. 2010 – Sep. 2011

- Process data analysis on daily plant data to gain insight on performance and help in case of troubleshooting.
- Developed key performance indicator (KPI's) dashboard using wrangling, statistical analysis, and visualization of the plant historian data.

Education

Masdar Institute

Abu Dhabi, UAE

PH.D. CHEMICAL ENGINEERING — GPA 3.67/4.0

Jan. 2014 – Dec. 2017

- Research focused on biorefinery process design, process optimization, experiment design, and biomass characterization.
- **Dissertation title:** Valorization of Mixed Lignocellulosic Residues in the UAE using a Biorefinery Concept.
- Select courses: Bioprocess Modeling, Biorefinery Processes and Products, Data Sampling and Analysis.

American University of Sharjah

Sharjah, UAE

M.SC. CHEMICAL ENGINEERING — GPA 3.67/4.0

Sep. 2011 – Jul. 2013

- Research focused on Chemical Process Design, Process Simulation, and Process Optimization.
- Select courses: Kinetics and Reactor Design, ChE Thermodynamics, Natural Gas Processes Optimization, Catalysis.

University of Engineering and Technology Lahore

Lahore, Pakistan

B.SC. CHEMICAL ENGINEERING — GPA 3.48/4.0

Sep. 2006 – Jul. 2010

Awards & Scholarship

2017	JupyterCon Student Scholarship , NumFOCUS & O'Reilly Media	NY, U.S.A
2015	Advanced Study Program at MIT , Masdar Institute & MIT Exchange Program	Boston, U.S.A
2014	PhD Award , Masdar Institute	Abu Dhabi, U.A.E
2011	Graduate Teaching Assistantship Award , American University of Sharjah	Sharjah, U.A.E

Expertise

Strengths	Process Design, Optimization, Techno-Economic Assessment, Statistical Data Analysis, Data Visualization
Software	MATLAB [®] , Python, Aspen Plus [®] , Aspen HYSYS [®] , SuperPro Designer [®]
Certification	Python for Data Science and Machine Learning — Udemy
Languages	English, Urdu, Punjabi

Interest

Sports\Fitness	Cricket fanatic (Captain of University Team), Badminton, Squash, Running, Gym (irregular)
Leisure	Fiction (this year favorite — Exit West by Mohsin Hamid), Dine out, Cinema

List of Publications

Journal Articles

1. **Ashraf, M. T.**, Schmidt, J. E., **2018**, Process Simulation and Economic Assessment of Hydrothermal Pretreatment and Enzymatic Hydrolysis of Multi-feedstock Lignocellulose — Separate vs Combined Processing, *Bioresour. Technol.*, 249, 835–843.
2. **Ashraf, M. T.**, Thomsen, M. H., Schmidt, J. E., **2017**, Hydrothermal Pretreatment and Enzymatic Hydrolysis of Mixed Green and Woody Lignocellulosics from Arid regions, *Bioresour. Technol.*, 238, 369–378.
3. **Ashraf, M. T.**, Schmidt, J. E., Kujawa, J., Kujawski, W. & Arafat, H. A., **2017**, One-dimensional Modeling of Pervaporation Systems using a Semi-empirical Flux Model. *Sep. Purif. Technol.* 174, 502–512.
4. **Ashraf, M. T.** et al., **2016**, Estimation of Bioenergy Potential for Local Biomass in the United Arab Emirates. *Emirates J. Food Agric.* 28, 99–106.
5. **Ashraf, M. T.**, Chebbi, R. & Darwish, N. A., **2013**, Process of p-Xylene Production by Highly Selective Methylation of Toluene. *Ind. Eng. Chem. Res.* 52, 13730–13737.
6. Chebbi, R., Qasim, M., Darwish, N. A. & **Ashraf, M. T.**, **2013** Optimization and Cost-Oriented Comparison of Ammonia- and Propane-Compression Refrigeration for the Recovery of Natural Gas Liquids. *Energy Technol.* 1, 573–580.

Book Chapter

1. Torres, A.I., **Ashraf, M. T.**, Chaturvedi, T., Schmidt J. E., Stephanopoulos, G., Hydrothermal Pretreatment: Process Modeling and Economic Assessment within the Framework of Biorefinery Processes. In: Ruiz HA, Thomsen MH, Trajano HL, editors. *Hydrothermal Processing in Biorefineries*. Springer; 2017.

Conference Proceedings

1. **Ashraf, M. T.** et al., **2016**, Optimization of Lignocellulosic Waste Biorefinery using Multi-Actor Multi-Objective Mathematical Framework. in 26th European Symposium on Computer Aided Process Engineering (eds. Kravanja, Z. & Bogataj, M.) 1317–1322.
2. **Ashraf, M. T.**, Bastidas-Oyanedel, J.-R. & Schmidt, J. E., **2015**, Conversion Efficiency of Biogas to Liquids Fuels through Fischer-Tropsch Process. in 23rd European Biomass Conference and Exhibition 23, 1008–1015.
3. **Ashraf, M. T.**, Al-Boainain, S., Belasri, D. & Schmidt, J. E., **2014**, Biogas potential of Bermuda grass and Clerodendrum inerme from the Emirate of Abu Dhabi. in XI Latin American Symposium of Anaerobic Digestion 403–410.
4. Bochenski, T., Torres, A. I., **Ashraf, M. T.**, Schmidt, J. E. & Stephanopoulos, G., **2016** Evaluation of the production of lipids for fuels and proteins from microalgae by decomposition of the processing network. in Proceedings of the 26th European Symposium on Computer Aided Process Engineering – ESCAPE 26 (eds. Kravanja, Z. & Bogataj, M.) 1635–1640.