

M. Ziyen Sheriff

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EDUCATION

Doctor of Philosophy in Chemical Engineering	Texas A&M University, College Station, TX Thesis: Monitoring process degradation through operating regime based process monitoring Advisors: M. Nazmul Karim, Mohamed N. Nounou Cumulative GPR: 4.00/4.00	Anticipated: May 2020
Master of Science in Chemical Engineering	Texas A&M University at Qatar, Doha, Qatar Thesis: Improved Shewhart chart using multiscale representation Advisor: Mohamed N. Nounou Cumulative GPR: 3.74/4.00	Awarded: July 2015
Bachelor of Science in Chemical Engineering	Texas A&M University at Qatar, Doha, Qatar	Awarded: May 2013

PROFESSIONAL EXPERIENCE (SUMMARY)

Graduate Assistant	Department of Chemical Engineering, Texas A&M University at Qatar, Doha, Qatar	July 2016 – Present
Graduate Research Assistant	Artie McFerrin Department of Chemical Engineering, Texas A&M University, College Station, TX	Sept 2015 – July 2016
Graduate Teaching Assistant	Department of Chemical Engineering, Texas A&M University at Qatar, Doha, Qatar	Aug 2013 – Aug 2015
Independent Study Lab Math Tutor	Student Learning Center. Texas A&M University, College Station, TX	Sept 2012 – Dec 2012
Process Engineering Intern	Qatar Petrochemical Company (QAPCO), Messaieed, Qatar	June 2012 – Aug 2012
Peer Tutor	Office of Academic Supplemental Instruction Services (OASIS), Texas A&M University at Qatar, Doha, Qatar	Jan 2013 – May 2013 Sept 2010 – Aug 2012

PUBLICATIONS (SUMMARY)

Journal Papers	:	5
Book Chapters	:	1
Peer Reviewed Conference Papers / Presentations	:	5
Additional Conference Presentations / Posters	:	11
Google Scholar Citations	:	62

AWARDS AND HONORS

Research Excellence Travel Grant	Research Development Taskforce, Texas A&M University at Qatar, Doha, Qatar	Apr. 2017 – June 2017 Oct. 2014 – Dec. 2014
Tau Beta Pi Engineering Honor Society	Member, Texas A&M University at Qatar, Doha, Qatar	Jan. 2012 – Present
Omega Chi Epsilon Chemical Engineering Honor Society	Member, Texas A&M University at Qatar, Doha, Qatar	Jan. 2012 – Present
The Association of Former Students Scholarship	Texas A&M University, College Station, TX	Aug. 2012 – May 2013
Texas A&M University at Qatar Scholarship	Texas A&M University at Qatar, Doha, Qatar	Aug. 2011 – May 2013
Student Employment Office Scholarship	Texas A&M University at Qatar, Doha, Qatar	Aug. 2012 – May 2013
Distinguished Student for High Achievement	Texas A&M University at Qatar, Doha, Qatar	Aug. 2009 – May 2012

TECHNICAL SKILLS

- Advanced knowledge of ASPEN Plus (process design and economics software).
- Advanced knowledge of ASPEN Plus Dynamics (process dynamics and control software).
Advanced knowledge of MATLAB.
- Familiar with SAS, R, and JMP (business, statistical, and data analysis software).

RESEARCH INTERESTS AND PROJECTS (SUMMARY)

Current Project: Utilization of different state estimation techniques to monitor changes in process and state parameters (both measurable and unmeasurable), to improve economic benefits to process plants through early detection of process degradation.

Research Interests: Process systems engineering with a particular emphasis on process modeling, estimation, fault detection, and control. The algorithms and tools developed are utilized in many applications to improve the operation of various chemical, environmental, biological, and electrical systems

JOURNAL PUBLICATIONS

Published

5. **M. Z. Sheriff**, M. N. Karim, H. N. Nounou, and M. N. Nounou, "Process monitoring using PCA-based GLR methods : A comparative study," *J. Comput. Sci.*, vol. 27, pp. 227–246, 2018.
4. **M. Z. Sheriff**, M. Mansouri, M. N. Karim, H. Nounou, and M. Nounou, "Fault detection using multiscale PCA-based moving window GLRT," *J. Process Control*, vol. 54, pp. 47–64, Jun. 2017.
3. **M. Z. Sheriff** and M. N. Nounou, "Improved fault detection and process safety using multiscale Shewhart charts," *J. Chem. Eng. Process Technol.*, vol. 8, no. 2, pp. 1–16, 2017.
2. M. Mansouri, **M. Z. Sheriff**, R. Baklouti, M. Nounou, H. Nounou, A. Ben Hamida, and M. N. Karim, "Statistical Fault Detection of Chemical Process - Comparative Studies," *J. Chem. Eng. Process Technol.*, vol. 07, no. 01, pp. 1–10, 2016.
1. G. Chen, T. Huang, M. C. Mariani, R. Espandary, R. Kanés, **M. Sheriff**, and S. Srinivasan, "Spectral analysis and generation of certain highly oscillatory curves related to chaos, part 2: Calculation aspects," *Phys. A Stat. Mech. Its Appl.*, vol. 392, pp. 4036-4047, 2013

BOOK CHAPTERS

Published

1. **M. Z. Sheriff**, C. Botre, M. Mansouri, H. Nounou, M. Nounou, M.N. Karim, *Process Monitoring Using Data-Based Fault Detection Techniques: Comparative Studies*, in: *Fault Diagnosis Detect.*, InTech, 2017. doi:10.5772/67347.

CONFERENCE - PEER-REVIEWED PAPERS & PRESENTATIONS

Published

5. **M. Z. Sheriff**, M.N. Karim, M.N. Nounou, H. Nounou, M. Mansouri, Monitoring of chemical processes using improved multiscale KPCA, in: 2017 4th Int. Conf. Control. Decis. Inf. Technol., IEEE, 2017: pp. 0049–0054. doi:10.1109/CoDIT.2017.8102565.
4. **M.Z. Sheriff**, M.N. Karim, M.N. Nounou, H. Nounou, M. Mansouri, Fault detection of nonlinear systems using an improved KPCA method, in: 2017 4th Int. Conf. Control. Decis. Inf. Technol., IEEE, 2017: pp. 0036–0041. doi:10.1109/CoDIT.2017.8102563.
3. **M. Z. Sheriff**, M.N. Nounou, Enhanced performance of shewhart charts using multiscale representation, in: 2016 Am. Control Conf., IEEE, Boston, MA, 2016: pp. 6923–6928. doi:10.1109/ACC.2016.7526763.
2. **M. Z. Sheriff**, F. Harrou, and M. Nounou, “Univariate process monitoring using multiscale Shewhart charts,” in 2014 International Conference on Control, Decision and Information Technologies (CoDIT), 2014, pp. 435-440.
1. **M. Z. Sheriff**, S. Taha, and M. Castier, “Thermodynamic sound speed of multiphase systems using the Peng-Robinson, Mattedi-Tavares-Castier, and PC-SAFT equations of state,” in the 13th International Conference of Properties and Phase Equilibria for Products and Process Design, 2013, no. May, pp. 1-13.

ADDITIONAL CONFERENCE PRESENTATIONS AND POSTERS

Presentations

5. **M.Z. Sheriff**, C. Botre, M.N. Karim, H. Nounou, M. Nounou, A review of generalized likelihood ratio based monitoring techniques, in: 2018 AIChE Spring Meet. Process Monit. Anal. II, Orlando, FL, 2018.
4. **M.Z. Sheriff**, C. Botre, H. Nounou, M.N. Karim, M. Nounou, Process monitoring using a PCA-based exponentially weighted generalized likelihood ratio chart, in: 2017 AIChE Annu. Meet. Data Inf. Syst., Minneapolis, MN, 2017.
3. **M.Z. Sheriff**, C. Botre, M. Mansouri, H. Nounou, M. Nounou, M.N. Karim, Data based process monitoring of industrial processes using multiscale nonlinear multivariate statistical methods, in: 2016 AIChE Annu. Meet. Syst. Process Control, San Francisco, CA, 2016.
2. **M.Z. Sheriff**, M. Mansouri, M.N. Karim, H. Nounou, M. Nounou, Improved fault detection using a moving window generalized likelihood ratio test, in: 2016 AIChE Spring Meet. Decis. Ind. Process Syst. III, Houston, TX, 2016.
1. **M.Z. Sheriff**, M. Nounou, Fault detection using multiscale Shewhart charts: Algorithms and applications, in: 2016 AIChE Spring Meet. Fuels Petrochemicals Div., Houston, TX, 2016.

Posters

Texas A&M University at Qatar Research and Industry Showcase, Doha, Qatar

Presented the following posters highlighting research progress:

- “Data-driven process systems engineering” Apr. 2018
 - “Monitoring multivariate processes using a multiscale-PCA based moving window GLRT fault detection algorithm.” Apr. 2017
 - “Assessment of assumption violations on the performance of Shewhart charts” Mar. 2015
 - “Improved monitoring using multiscale Shewhart charts” Mar. 2015
 - “A PCA-based EWMA fault detection method”. Apr. 2014
- 2013 Midwest Political Science Association, Chicago, IL** Apr. 2013

- Presented a self-authored political science research paper and poster titled “Pushing for post-war peace: Renewal of an agriculture-driven society”.
- Paper analyzed the possibility of using agriculture as a means of establishing peace in the island of Sri Lanka after its civil war ended in Apr. 2009.

TEACHING AND RESEARCH EXPERIENCE (DETAILED)

- Texas A&M University at Qatar**, Doha, Qatar July 2016 - Present
Graduate Assistant – Department of Chemical Engineering
- Developing a process monitoring and fault detection algorithm to detect process and equipment degradation over time, in order to carry out preventive maintenance by monitoring and evaluating economic costs for different operating regimes.
 - Mentoring new graduate students who join the research group.
- Texas A&M University**, College Station, TX Aug. 2015 – July 2016
Graduate Research Assistant – Artie McFerrin Department of Chemical Engineering
- Assessed different techniques to improve the fault detection capabilities of the Generalized Likelihood Ratio (GLR) chart that can be applied for both univariate and multivariate statistical monitoring purposes.
 - Evaluating student performance through weekly homework assignments, course projects, and assign grades for 80-90 students. Held help sessions when required.
- Courses:** Process Dynamics and Control (CHEN 461) Fall 2015 & Spring 2016
Aug. 2013 – Aug. 2015
- Texas A&M University at Qatar**, Doha, Qatar
Graduate Teaching/Research Assistant – Department of Chemical Engineering
- Developed a fault detection algorithm for a multiscale Shewhart chart using wavelet-based data representation, which provides improved fault detection ability when compared to the conventional Shewhart chart.
 - Evaluated student performance through weekly homework assignments, exams and assigned grades for 20-30 students. Held help sessions when required.
- Courses:** Elementary Chemical Engineering (CHEN 204) Fall 2013
Chemical Engineering Materials (CHEN 313) Spring 2014 & Spring 2015
Process Safety Engineering (CHEN 455) Fall 2014
Petroleum Engineering Numerical Methods (PETE 301) Summer 2015- Organized laboratory demonstrations when required by the class and professor.

Office of Academic Supplemental Instruction Services (OASIS), Doha, Qatar Sept. 2010 – Aug. 2013
Peer Tutor at Texas A&M University at Qatar

 - Tutored freshman level Chemistry, Mathematics, and Physics.
 - Tutored technical writing to students of all academic classifications.
 - **Student Employee of the Year** (Texas A&M University a Qatar) Sept. 2011 – May 2012

Student Learning Center, College Station, TX Aug. 2012 – Dec. 2012
Independent Study Lab Math Tutor at Texas A&M University

 - Mentored pre-calculus students to ensure that they were prepared for undergraduate college level calculus classes

Texas A&M University at Qatar, Doha, Qatar
Undergraduate Research Assistant (Thermodynamics) 2011-2013
Advisor: Marcelo Castier

 - Compared three equations of state to analyze which equation could be best used to model situations of accidental fluid discharge from pipes.
 - This project was funded by the Qatar National Research Fund (QNRF) Undergraduate Research Experience Program (11th cycle).

Undergraduate Research Assistant (Linear control systems modeling) 2011-2012
Advisors: Mohamed Nounou, Hazem Nounou

 - Involved studying linear control systems and the effect that noise had on various data sets, and attempting to reduce the effect of noise on the data.

Undergraduate Research Assistant (Mathematics) 2011-2012
Advisors: Goong Chen, Tingwen Huang

 - Involved the generation of MATLAB plots, which were then used to predict trends for certain equations related to chaos theory, with a journal paper published in Physica A.

LEADERSHIP AND SERVICE

- International Capstone Plant Design Project (Methanol Plant – Celanese)** Spring 2013
- Part of a plant design group with members on both the Qatar and College Station Texas A&M University campuses. Experience enhanced collaboration skills with student peers in different time zones and from different backgrounds.
- Not Your Average Spring Break**, Cape Town, South Africa Mar. 2013
- Participated as part of a service group of student leaders from Hamad Bin Khalifa University and Texas A&M University, who helped teach children in rural camp in Cape Town.
 - Helped with the construction of a shelter that could be used as a school for students in the camp.
- Aggie Service-Learning Experience**, Bujagali Falls, Uganda May 2012
- Participated as part of a service group from Texas A&M University, who helped teach in pre, primary, and secondary schools in Bujagali Falls, Uganda.
 - Helped with the construction of a shelter for workers at a fish pond in Bujagali Falls, Uganda.
- Spring Leadership Exchange Program**, College Station, TX & Doha, Qatar
- Selected as 1 of 15 student leaders from the Texas A&M University at Qatar campus to travel to College Station, TX, to interact and dialogue with student leader peers from the main campus. Dialogue topics included leadership, communication, organizational styles, diversity and faith.
 - Hosted student leaders from the College Station campus when they visited Doha, Qatar.
- Engineers Without Borders Qatar**, Doha Qatar
- An active member who contributed engineering knowledge to discussions with regards to the development of a sanitation system in a rural city in India.
 - Active discussions with other members who were industrial professions from various backgrounds working in Doha, Qatar.
 - Support received from Human Welfare Foundation based in India.
- Student Engineers' Council**, Doha, Qatar 2009-2015
- Lecture Series Chair* 2011-2012
- Organized and received industry professionals from Exxon Mobil Qatar and Shell Qatar as guest lecturers, who presented lectures on engineering topics such as process safety, engineering ethics to the students at Texas A&M University at Qatar.
- Social Outreach Club (SOC)**, Doha, Qatar 2011-2012
- Co-Founder and Secretary*
- Organized events such as literacy programs to improve the English of janitorial staff at Texas A&M University at Qatar and other Education City universities, visits to the pediatric wing of Hamad Hospital and animal shelters, and other social welfare initiatives.
- South Asian Students' Association (SASA)**, Doha, Qatar 2011-2012
- Public Relations Officer*
- Involved in the promotion of cultural diversity at Texas A&M University at Qatar, achieved through the publicizing and promoting of events such as Cultural Night and period game nights.

PROFESSIONAL AND ADDITIONAL EXPERIENCE

- Qatar Petrochemical Company**, Mesaieed, Qatar June 2012 – Aug. 2012
- Process Engineering Intern*
- Worked with the olefin and polyolefin departments to learn how the overall poly-ethylene plant operated. Spent rotations (2-3 weeks) at the following departments: ethylene, poly-ethylene, utilities, and HSSE (health, safety, security and environment).
 - Provided possible plant improvement suggestions after carrying out calculations to assess the output and performance of the plant.

Education City Student Center, Doha Qatar

Building Manager

June 2013 – Aug. 2013

- Responsible for a variety of roles including the opening/closing of the building and coordinating with events management, security, and janitorial staff as well as other student employees to ensure the successful management of the student center.

Information Desk Student Employee

- Provided visitors to the student center with tours and also responsible for guiding guests to the right locations that they needed in the student center.

Tech Zone, Colombo, Sri Lanka

July 2010

Computer Technical Hardware Specialist

- Installed, repaired, maintained, troubleshoot, and upgraded desktop and notebook computers.

REFERENCES

Dr. Costas Kravaris

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Texas A&M University,
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Dr. Nazmul Karim

Department Head & Professor | Chemical Engineering
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Dr. Mohamed Nounou

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ADDITIONAL PORTFOLIOS

- **LinkedIn Profile:** <https://www.linkedin.com/in/mziyansheriff/>
- **Google Scholar Profile:** <https://scholar.google.com/citations?user=9qhfdpwAAAAJ&hl=en>