

Vinayaka Gude

Assistant Professor, Dept. of Marketing and Business Analytics
Texas A&M University - Commerce

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Education

PhD in Systems Engineering

2020

Missouri University of Science and Technology

Dissertation title: *"Hybrid computational intelligence techniques for prediction complex system behavior"*

Committee: *Steven Corns, Suzanna Long, Cihan Dagli, Ruwen Qin, XianBiao Hu*

MS in Systems Engineering

2017

Missouri University of Science and Technology

Thesis title: *"Artificial Intelligence for Predicting Fetal Outcomes from Heart Rate Patterns"*

Committee: *Steven Corns, Suzanna Long, Ruwen Qin*

BTech in Chemical Engineering

2015

Jawaharlal Nehru Technological University

Academic & Research Experience

Assistant Professor in Business Analytics

Fall 2021

Texas A&M University - Commerce

- Classes taught: **BUSA 511 – Business Analytics for Managers, BUSA 379 – Business Process Management & ERP Systems, BUSA 597 – Data Visualization and BUSA 423,523 – Business Analytics Programming.**
- Developed **BUSA 597 – Data Visualization** course.

Assistant Professor in Data Visualization

Fall 2020

Louisiana State University – Shreveport

- Developed **Introduction to Data Analysis** and **Data-driven storytelling** courses.
- Classes taught: **Data-driven storytelling (MCOM 290, MCOM 260), Introduction to Social Media Analytics (MCOM 249), Introduction to Data Analysis (MCOM 160) and Research Methods (MCOM 320).**

Doctoral Research Assistant

2017-2020

Missouri University of Science and Technology

- Development of traffic management strategies and economic analysis of floods in Missouri.
 - Developed **LSTM** to predict floods at 85% better accuracy than USGS.
 - Performed **Road Network Analysis** using GIS Shapefiles in **python**.
 - Conducted **Simulation** for what/if scenarios using **SUMO**.
 - Modeled a System of Systems architecture design for a smart traffic management.
- Development of GUI for Post-Disaster Infrastructure Restoration System
 - Developed an **application** to estimate resources required to restore a city post disaster.
 - **Validated** the results using the data available from **Joplin Tornado**.

Graduate Teaching Assistant

2018-2020

Missouri University of Science and Technology

- Taught **Introduction to Systems Engineering** (SYS 2310)
- Planned lessons and assignments, led discussion sections, graded papers and exams.
- Maintaining records on student progress/grades
- Leading class discussions and answering student questions

Graduate Research Assistant

2016-2017

Missouri University of Science and Technology

- Machine Learning Decision Support System fetal acidosis.
 - Performed exploratory data analysis for Fetal Heart Rate – **data smoothing, statistical analysis and data visualization** in **python**.
 - Implemented **Support Vector Machine** and **Random Forest** to predict Fetal States and achieved a classification accuracy of **97.68%**. The project is aimed at improving the accuracy and aiding the Hospitals in diagnosis to prevent asphyxia.
 - Developed a methodology to use umbilical cord pH data to **predict fetal acidosis** based on the CTG data and achieved an accuracy of **72.22%**.

Professional Experience

Research Intern

May 2016 - June 2016

Missouri University of Science and Technology

Developed and analyzed the production of Perovskite Solar cells using Spray/spin coating and various annealing techniques to identify suitable parameters for large-scale manufacturing of the solar cells.

Graduate Trainee

Coromandel Fertilizers

May 2015 - Dec 2015

Trained in performing process operations, monitoring the control systems, testing products, developing and evaluating Lean/Six-Sigma opportunities.

Publications

- **V. Nagendra, H. Gude, D. Sampath**, S. Corns and S. Long, "Evaluation of support vector machines and random forest classifiers in a real-time fetal monitoring system based on cardiotocography data," 2017 IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology (CIBCB), Manchester, 2017, pp. 1-6, doi: 10.1109/CIBCB.2017.8058546.
 - **Gude, V.**; Corns, S.; Long, S. Flood Prediction and Uncertainty Estimation Using Deep Learning. Water 2020, 12, 884.
 - **Gude, V.**, Corns, S., Dagli, C., & Long, S. (2020). Agent based modeling for flood Inundation mapping and rerouting. Procedia Computer Science, 168, 170-176.
 - J.Goldschmid, **V. Gude**, and S. Corns, "SoS Explorer Application with Fuzzy-Genetic Algorithms to Assess an Enterprise Architecture – A Healthcare Case Study," Procedia Computer Science, vol. 185, pp. 55–62, 2021.
 - M. M. Islam, M. Rahman, F. Heidari, and **V. Gude**, "Optimal onsite microgrid design for net-zero energy operation in the manufacturing industry," Procedia Computer Science, vol. 185, pp. 81–90, 2021.
 - J. Hale, S. Long, **V. Gude**, and S. Corns, "Using Trend Extraction and Spatial Trends to Improve Flood Modeling and Control," Data Visualization [Working Title], 2021.
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Research submitted and in progress

- **Gude, V.** et al.. " Evaluating the impact of Covid-19 on Small Business Enterprises" (outlet to be determined)
 - **Gude, V.** et al.. " Modelling a decision support system for Covid-19 using System dynamics and Fuzzy Inference " (submitted to Health Policy Research journal)
 - **Gude, V.** et al.. "Fetal acidosis prediction using Deep Learning" (to be submitted to Biosystems journal)
 - **Gude, V.** et al.. "Computational intelligence methodology for determining the delay association with gauge height and precipitation" (outlet to be determined)
 - **Gude, V.** et al.. System of Systems Architecture Assessment for a Smart Emergency Response System (outlet to be determined)
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Conference presentations

- 'Reinforcement Learning Framework for Road Restoration Planning' - **ASEM 2019**
 - 'Predictive Deep Learning for road flooding and dynamic traffic rerouting' - **CEGIS 2019**
 - 'Evaluating uncertainty in acidosis predictions' – **IISE 2020**
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Professional Memberships

- ASEM (American Society for Engineering Management)
- IEEE (Institute of Electrical and Electronics Engineers)
- IISE (Institute of Industrial and Systems Engineers)

Research skills

- Competent in Computational Intelligence techniques (Machine Learning, Deep Learning, Fuzzy Systems and Evolutionary Algorithms)
 - Proficient in Statistical programming languages and data analysis softwares (Python, R, Matlab, AMPL, Tableau)
 - Basic use of Geographic Information Systems (ArcGIS, QGIS, HEC-RAS)
 - Experienced in developing simulations.
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Current Research Interests

- Machine Learning and Deep Learning
 - Complex Systems Analysis and Simulations
 - Computational Intelligence for Health Care and Disaster Management
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University Service

Peer Educator

May 2016 - May 2019

Missouri University of Science and Technology

- Giving presentation on how to avoid high-risk behavior related to alcohol, drugs, tobacco, violence and unhealthy eating habits on campus
 - Providing education and advising students on overall wellness
 - Serve as a resource for students to connect with the University advising and counselling services.
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References

- Steven Corns, Associate Chair of Graduate Studies and Associate Professor
Department of Engineering Management and Systems Engineering
Missouri University of Science and Technology
(573) 341 - 6367, cornss@mst.edu
- Suzanna Long, Department Chair and Professor
Department of Engineering Management and Systems Engineering
Missouri University of Science and Technology
(573) 341 - 7621, longsuz@mst.edu
- Cihan Dagli, Professor and Founder and Director of Systems Engineering Graduate Program
Department of Engineering Management and Systems Engineering
Missouri University of Science and Technology
(573) 647 - 9125, dagli@mst.edu