Varun Chandola

Associate Professor
Computer Science and Engineering

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EDUCATION

Ph.D., Computer Science and Engineering — Sep 2009
University of Minnesota

B.Tech., Computer Science and Engineering — July 2002
Indian Institute of Technology Madras

PROFESSIONAL EXPERIENCE

Associate Professor, Dept. of Computer Science and Engineering — Aug 2020 – present
University at Buffalo, Buffalo, NY

Program Director, Office of Advanced Cyberinfrastructure — Oct 2021 – Oct 2025
National Science Foundation, Alexandria, VA

Assistant Professor, Dept. of Computer Science and Engineering — Aug 2013 – July 2020
University at Buffalo, Buffalo, NY

Staff Scientist, Div. of Computational Science and Engineering — Sep 2011 – Jul 2013
Oak Ridge National Laboratory, Oak Ridge, TN

Postdoctoral Fellow, Div. of Computational Science and Engineering — Sep 2009 – Aug 2011
Oak Ridge National Laboratory, Oak Ridge, TN

RESEARCH INTERESTS

- Machine Learning, Data Mining, Anomaly Detection

HONORS AND AWARDS

- NSF Director Recognition, NSF, 2025.
- UB Teaching Innovation Award, University at Buffalo, 2020.
- Early Teacher of the Year Award, University at Buffalo, School of Engineering and Applied Sciences, 2016.
- Article on "Virtualization of Evolving Power Grid" included as one of the best of the best 32 articles in the IEEE Smart Grid Compendium, 2015.
- NASA Worldwind Europa Challenge, second prize in the University category, 2014.
- ORNL Significant Achievement Award for developing the Settlement Mapper Technology, 2013.
- ACM Computing Survey article on "Anomaly Detection: A Survey" listed as 4^{th} Most Cited Publication in Computer Science/Data Mining in last 5 years (Microsoft Academic Search), 2012.

- Special Recognition for contributions to "Knowledge Discovery for Health Care" project at ORNL, 2012.
- Awarded Best LDRD Project titled - "Spatiotemporal Data Mining Framework for Monitoring Biomass at Regional and Global Scales", under the ORNL Laboratory Director's Research and Development Program, 2011.
- Best (top-6) paper recognition at NASA CIDU conference, 2010.
- Doctoral dissertation nominated for ACM Best Dissertation award from Computer Science Department, 2009.
- Recipient of Student Travel Awards at ICDM 2005, ICDM 2008 and SDM 2009.
- Research Excellence Award by Department of Computer Science, University of Minnesota, 2005.
- Best student paper award at 5^{th} International Conference on Data Mining (ICDM), November 2005.

GRANTS & CONTRACTS

Current Support

- **UB/VPRED: Awarded $200,000 for 2 years.**
  Title: Integrating AI with Ramanomics and quantum science for label-free mapping of biochemical environment in live cells to advance cellular diagnosis and molecular medicine Role: Principal Investigator (Share - 50%)
  Team: Nalini Ratha, Paras Prasad Duration: Dec. 1, 2025 - Nov. 30, 2027
- **AHRQ: Awarded $1,950,523 for 5 years.**
  Title: Implementing Personalized Cross-Sector Transitional Care Management to Promote Care Continuity, Reduce Low-Value Utilization, and Reduce the Burden of Treatment for High-Need, High-Cost Patients Role: Co-Principal Investigator (Share - 20%)
  Team: Elizabeth Bowen, Sabrina Casucci, Sharon Hewner (PI), Ekaterina Noyes, Suzanne Sullivan (SUNY Upstate) Duration: Apr. 1, 2021 - Mar. 31, 2026

Completed Support

- **DOE PSAAP-III: Awarded $8,530,200 for 5 years.**
  Title: Center for Exascale Simulation of Hybrid Rocket Motors
  Role: Co-Principal Investigator (Share - 20%)
  Team: James Chen, Paul Desjardin (PI), Matt Jones, Matthew Knepley, Abani Patra (Tufts), Mark Swihart
  Duration: Mar. 1, 2020 - Feb. 28, 2025
- **NSF FAI: Awarded $800,000 for 3 years.**
  Title: Building a fair recommender system for foster care services within the constraints of a sociotechnical system
  Role: Co-Principal Investigator (Share - 20%)
  Team: Winnie Chen, Melanie Sage, Atri Rudra, Kenneth Joseph (PI)
  Duration: Jan. 1, 2020 - Dec. 31, 2022.
- **NSF OAC: Awarded $499,814 for 3 years.**
  Title: OAC Core: Small: Scalable Non-linear Dimensionality Reduction Methods to Accelerate Scientific Discovery
  Role: Principal Investigator (Share - 25%)

Team: Jaroslaw Zola, Nils Napp, Olga Wodo
Duration: May 1, 2019 - Apr. 30, 2022.

- **Tiggee Inc.: Awarded $42,395 for 1 year.**
  Title: Anomaly Detection.
  Role: Principal Investigator (Share - 100%)
  Duration: June 1, 2019 - May 31, 2020.
- **SUNY Germination Program: Awarded $25,000 for 1 year.**
  Title: Building Ethical Artificial Intelligence. Role: Principal Investigator (Share - 16%).
  Team: Kenneth Joseph, Atri Rudra, Matt Bolton, Jonathan Manes, Mark Shepard
  Duration: July 1, 2018 - June 30, 2019.

- **Mozilla Foundation: Awarded $150,000 for 1 year.**
  Title: Mozilla Responsible Computer Science Challenge Grant
  Role: Co-Principal Investigator (Share - 10%)
  Team: Atri Rudra, Matthew Bolton, Kenneth Joseph, Jesse Hartloff, Steven Ko, Jonathan Manes, Mark Shepard, Jennifer Winikus
  Duration: June 1, 2019 - May 31, 2020
- **JDRF: Awarded $198,694 for 2 years**
  Title: Beyond Compartment models: Using Big-Data to enhance model for controller development for the Artificial Pancreas.
  Role: Co-Principal Investigator (Share - 40%).
  Team: Tarunraj Singh (PI), Lucy Mastrandrea.
  Duration: July 1, 2019 - June 30, 2020.

- **CTSI: Awarded $44,953 for 1 year.**
  Title: Early Detection of Respiratory Compromise to Prevent Harm of the Hospitalized Opioid Treated Patient
  Role: Co-Investigator (Share - 33%)
  Team: Carla Jungquist (PI), Lora Cavuto, Manoj Mammen
  Duration: Apr. 1, 2019 - Mar. 31, 2020.
- **CTSI: Awarded $44,953 for 1 year.**
  Title: The Pathway to Sleep Health Disparities in Middle-aged and Older Adults: The Role of Social Determinants
  Role: Co-Investigator (Share - 7%)
  Team: Rebecca Lorentz (PI), Yu-Ping Chang, Ling Bian, Heather Orom, Chin-Shang Li
  Duration: Apr. 1, 2019 - Mar. 31, 2020.
- **NSF: Awarded $999,990 for 5 years.**
  Title: MRI: Acquisition of High Performance Computing Infrastructure to Support Computational and Data Enabled Science and Engineering
  Role: Co-Principal Investigator (Share - 10%)
  Team: Thomas Furlani (PI), Jochen Autschbach, Abani Patra, Bruce Pitman
  Duration: October 1, 2017 to September 30, 2022.
- **Google Cloud Platform $1.65K for 1 Year.**
  Title: Google Cloud Platform Education Grant.
  Role: Principal Investigator (Share - 100%)
  Duration: Sep. 1, 2016 to Aug. 31, 2017.

- **NSF: Awarded $200K for 1 year.**
  Title: EAGER: An Investigation of the Propagation of Error-Resistant and Error-Prone Messages Over Large-Scale Information Networks.
  Role: Co-Principal Investigator (Share - 33%)
  Team: Raghav Rao (PI), Manish Agrawal (USF)
  Duration: Sep. 1, 2016 to Aug. 31, 2017.
- **DOE/ORNL: Awarded $150,000 for 3 Years.**
  Title: Energy/Water Nexus Knowledge Discovery Framework.
  Role: Principal Investigator
  Team: Budhendra Bhaduri (ORNL/PI), Robin Graham (ANL), Ian Foster (UIUC)
  Duration: Aug. 1, 2016 to Sep. 30, 2018.
- **NSF: Awarded $4,975K for 5 Years.**
  Title: CC*DNI DIBBs: Data Analysis and Management Building Blocks for Multi-Campus Cyberinfrastructure through Cloud Federation.
  Role: Co-Investigator and UB Science Lead (Share - 9-credit Tuition Support and Stipend for 1 RA student for 5 years)
  Team: David Lifka (PI - Cornell), Thomas Furlani, Richard Wolski (UCSB)
  Duration: October 1, 2015 to September 30, 2020.
- **NSF: Awarded $1,215K for 4 Years.**
  Title: TWC: Medium: Collaborative: Data is Social: Exploiting Data Relationships to Detect Insider Attacks.
  Role: Co-Principal Investigator (Share - 25%)
  Team: Hung Ngo (PI), Oliver Kennedy, Shambhu Upadhayaya
  Duration: October 1, 2014 to September 30, 2018.
- **Microsoft Azure: Awarded $20K for 2 Years.**
  Title: Microsoft Azure Research Award.
  Role: Principal Investigator.
  Duration: Nov. 1, 2014 to Aug. 07, 2016.
- **Amazon Web Services: Awarded $5K for 1 Year.**
  Title: AWS Machine Learning Research Grant.
  Role: Principal Investigator.
  Duration: March 1, 2014 to February 29, 2016.

PUBLICATIONS & SCHOLARLY RECORD

Peer-Reviewed Journal Articles

1. Integrating Artificial Intelligence with Ramanomics for label-free monitoring of biochemical environment in live cells to advance cellular diagnostics and molecular medicine. Varun Chandola, Andrey Kuzmin, Artem Pliss, Alexander Baev, Giovana Texeira and Paras Prasad. To Appear In American Chemical Society (ACS) Omega, 2026. (Impact factor: 4.3)
2. Balancing fidelity and flexibility: a case study presentation of an augmented dynamic adaptation process for socio-technical innovations in healthcare. Suzanne S Sullivan, Sharon Hewner, Sabrina Casucci, Elizabeth Bowen, Varun Chandola, Amy M Sheehan, Amanda J Anderson, Jarod Gabello and Katia Noyes. Frontiers in Health Services, 2026. (Impact factor: 2.7)
3. Shear Condition Classification of Cracked Reinforced Concrete Beams Using Machine Learning. Rodrigo Castillo (PhD student), Negar Elhami-Khorasani, Pinar Okumus and Varun Chandola.

Journal of Bridge Engineering, 2025. (Impact factor: 3.50)

4. COMODO: Configurable morphology distance operator. **Parth Desai** (PhD student), **Namit Juneja** (PhD student), Varun Chandola, Jaroslaw Zola and Olga Wodo. Computational Materials Science, 2024. (Impact factor: 3.10)
5. Using crack width for shear, stiffness, and stirrup strain history predictions for reinforced concrete beams. Rodrigo Castillo (PhD student), Negar Elhami-Khorasani, Pinar Okumus and Varun Chandola. Structure and Infrastructure Engineering, 2024. (Impact factor: 2.60)
6. Learning Manifolds from Non-stationary Streams. **Suchismit Mahapatra** (PhD student) and Varun Chandola. Journal of Big Data, 2024. (Impact factor: 1.98)
7. Large Deviations Anomaly Detection (LAD) for collection of multivariate time series data: Applications to COVID-19 data. **Sreelekha Guggilam** (PhD student), Varun Chandola and Abani Patra. Journal of Computational Science, 72, 2023. (Impact factor: 3.81)
8. Physics informed machine learning for chemistry tabulation. **Amol Salunkhe** (PhD student), Dwyer Deighan (PhD student), Paul Desjardin and Varun Chandola. Journal of Computational Science, 69, 2023. (Impact factor: 3.81)
9. Machine Learning for Shear Strength of Reinforced-Concrete Beams. **Rodrigo Castillo** (PhD student), Pinar Okumus, Negar Elhami Khorasani, and Varun Chandola. Structural Journal, 119 (5), 2022. (Impact factor: 1.74)
10. Tracking clusters and anomalies in evolving data streams. **Sreelekha Guggilam** (PhD student), Varun Chandola and Abani Patra. Statistical Analysis and Data Mining Journal, 15(2), 2022. (Impact factor: 1.40)
11. Multi-step ahead predictive model for blood glucose concentrations of type-1 diabetic patients. **Syed Mohammed Arshad Zaidi** (PhD student), Varun Chandola, Muhanned Ibrahim, Bianca Romanski, Lucy D Mastrandrea and Tarunraj Singh. Scientific Reports, 11(1), 2021. (Impact factor: 4.60)
12. DST-Predict: Predicting Individual Mobility Patterns From Mobile Phone GPS Data. **Syed Mohammed Arshad Zaidi** (PhD student), Enki Yoo and Varun Chandola. IEEE Access, 9, 2021. (Impact factor: 3.90)
13. Explaining Supervised Learning Models: A Preliminary Study on Binary Classifiers. Xiowei Wang, Ann Bisantz, Matthew Bolton, Lora Cavuoto and Varun Chandola. Ergonomics in Design, 28(3), 20-26, 2020. (Impact factor: 0.34)
14. Learning Manifolds from Dynamic Process Data. **Frank Schoeneman** (PhD student), Varun Chandola, Nils Napp, Olga Wodo, and Jaroslaw Zola. Algorithms, 13 (20), 2020. (Impact Factor: 1.51)
15. longSil: an Evaluation Metric to Assess Quality of Clustering Longitudinal Clinical Data. **Duc Thanh Anh Luong** (PhD student), Prerna Chaudhary, Mahin Ramezani and Varun Chandola. Journal of Healthcare Informatics Research, 3(4), 441–459, 2019. (Impact factor: 4.30)
16. Identifying Patients Experiencing Opioid-Induced Respiratory Depression During Recovery From Anesthesia: The Application of Electronic Monitoring Devices. Carla R. Jungquist, Varun Chandola, Cheryl Spulecki, Kenneth V. Nguyen, Paul Crescenzi, Dejen Tekeste, **Phani Ram Sayapaneni** (MS Student). Worldviews Evidence Based Nursing, 2019. (Impact factor: 2.50)

17. Machine Learning for Energy-Water Nexus: Challenges and Opportunities. **Syed Mohammed Arshad Zaidi** (PhD student), Varun Chandola, Melissa Allen, Ryan McManamay, Budhendra L. Bhaduri. Journal of Big Earth Data, 2018. (Impact factor: 4.00)
18. A Survey of Analytical Methods for Inclusion in a New Energy-Water Nexus Knowledge Discovery Framework. Melissa R. Allen, **Syed Mohammed Arshad Zaidi** (PhD student), Varun Chandola, April M. Morton, Christa M. Brelsford, Ryan A. McManamay, Binita KC, Jibonananda Sanyal, Robert N. Stewart, and Budhendra L. Bhaduri. Journal of Big Earth Data, 2018. (Impact factor: 4.0)
19. Modeling Mortality Risk in Homebound Older Adults using Routinely-Collected Nursing Data. **Suzanne Sullivan** (PhD committee), Varun Chandola, Bonnie Westra, and Sharon Hewner. Journal of Advanced Nursing, # pages - 31, 2018. (Impact factor: 2.00)
20. Similarity Metrics for SQL Query Clustering. **Gokhan Kul** (PhD committee), **Duc Thanh Anh Luong** (PhD student), **Ting Xie** (PhD Committee), Varun Chandola, Oliver Kennedy and Shambhu Upadhyaya. IEEE Transactions on Knowledge and Data Engineering, # Pages 16, 2018. (Impact factor: 2.78)
21. Extracting Deep Phenotypes for Chronic Kidney Disease using Electronic Health Records. **Duc Thanh Anh Luong** (PhD student), **Dinh Tran** (PhD student), Varun Chandola, Chet Fox, Wilson Pace, Joseph Vassalotti, Jennifer Carroll, Miriam Dickinson, Matthew Withiam-Leitch, Nikhil Satchindanand, Min Yang, and Craig Smail. eGems - Generating Evidence & Methods to Improve Patient Outcomes, # pages - 15, 2017. (Impact factor: N/A)
22. A Reference Based Analysis Framework for Understanding Anomaly Detection Techniques for Symbolic Sequences. Varun Chandola, Varun Mithal and Vipin Kumar. Data Mining and Knowledge Discovery, Springer. 28(3), pages 702–735, 2014. (Impact factor: 1.99)
23. Image Based Characterization of Formal and Informal Neighborhoods in an Urban Landscape. Jordan Grasser, Anil Cheriyadat, Ranga R. Vatsavai, Varun Chandola, Jordan Long, and Edward Bright. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing. 5(4), pages 1164–1176, 2012. (Impact factor: 3.03)
24. GX-Means: A model-based divide and merge algorithm for geospatial image clustering. Ranga R. Vatsavai, Christopher T. Symons, Varun Chandola, and Goo Jun. Procedia Computer Science. Vol. 4, pages 186–195, 2011. (Impact factor: N/A)
25. A Scalable Gaussian Process Analysis Algorithm for Biomass Monitoring. Varun Chandola and Ranga R. Vatsavai. Statistical Analysis and Data Mining. 4(4), pages 430–445, 2011. (Impact factor: N/A)
26. Anomaly Detection for Discrete Sequences - A Survey. Varun Chandola, Arindam Banerjee, and Vipin Kumar. IEEE Transactions on Knowledge and Data Engineering (TKDE), 24(5), pages 823–839, 2011. (Impact factor: 2.067)
27. Anomaly Detection - A Survey. Varun Chandola, Arindam Banerjee, and Vipin Kumar. ACM Computing Surveys (CSUR), 41(3), # pages - 58, 2009. (Impact factor: 3.37)
28. Summarization - Compressing Data into an Informative Representation. Varun Chandola and Vipin Kumar. Knowledge And Information Systems Journal (KAIS), 12(3), pages 355–378, 2007. (Impact factor: 1.782)

Refereed Proceedings Articles

1. Physics-Informed Spectral Reconstruction for Low-SNR Raman Spectroscopy with Peak-Preserving Constraints. **Tanvi Ranga** (PhD Student), Davoud Adinehloo, Nalini Ratha and Varun Chandola. In Proceedings of the Workshop on Computer Vision for Multimodal Microscopy Image Analysis at the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2026.
2. Modeling Patient Care Trajectories with Transformer Hawkes Processes. **Saumya Pandey** (PhD Student) and Varun Chandola. In Proceedings of the 2026 IEEE International Conference on Healthcare Informatics, 2026.
3. Resource Efficient Bayesian Optimization. **Namit Juneja** (PhD Student), Varun Chandola, Jaroslaw Zola, Olga Wodo and **Parth Desai** (PhD student). In Proceedings of the 2024 IEEE 17th International Conference on Cloud Computing (CLOUD), 2024. (Acceptance Rate: 19.4%)
4. Predicting Shear, Stiffness and Stirrup Strain Histories in Reinforced Concrete Beams Using Machine Learning. **Rodrigo Castillo** (PhD student), Pinar Okumus, Negar Elhami-Khorasani and Varun Chandola. In Proceedings of the International Symposium of the International Federation for Structural Concrete, 2023. (Acceptance Rate: N/A)
5. An Ensemble-Based Deep Framework for Estimating Thermo-Chemical State Variables from Flamelet Generated Manifolds. **Amol Salunkhe** (PhD student), Georgios Georgalis, Abani Patra, Varun Chandola. AIAA SCITECH 2023 Forum. (Acceptance Rate: N/A)
6. Mutual Information Scoring: Increasing Interpretability in Categorical Clustering Tasks with Applications to Child Welfare Data. **Pranav Sankhe** (PhD student), Seventy F Hall, Melanie Sage, Maria Y Rodriguez, Varun Chandola and Kenneth Joseph. In Proceedings of 15^{th} International Conference on Social Computing, Behavioral-Cultural Modeling and Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS), 2022. (Acceptance Rate: 44%)
7. Classifying Anomalous Members in a Collection of Multivariate Time Series Data Using Large Deviations Principle: An Application to COVID-19 Data. **Sreelekha Guggilam** (PhD student), Varun Chandola and Abani K Patra. In Proceedings of 21^{st} International Conference on Computational Science, ICSS, 2022. (Acceptance Rate: 30%)
8. ChemTab: A Physics Guided Chemistry Modeling Framework. **Amol Salunkhe** (PhD student), **Dwyer Deighan** (PdD student), Paul DesJardin and Varun Chandola. In Proceedings of 21^{st} International Conference on Computational Science, ICSS, 2022. (Acceptance Rate: 30%)
9. Explainable Deep Learning for Readmission Prediction with Tree-GloVe Embedding. **Jialiang Jiang** (PhD student), Sharon Hewner and Varun Chandola. In Proceedings of the 9th International Conference on Health Informatics, ICHI, 2021. (Acceptance Rate: 36%)
10. Integrated Clustering and Anomaly Detection (INCAD) for Streaming Data. **Sreelekha Guggilam** (PhD student), **Arshad Zaidi** (PhD student), Varun Chandola and Abani Patra. 19th International Conference on Computational Sciences (ICCS), 2019. (Acceptance Rate: 30%)
11. Tree-based Regularization for Interpretable Readmission Prediction. **Jialiang Jiang** (PhD student), Sharon Hewner and Varun Chandola. In Proceedings of the AAAI Spring Symposium on Machine Learning and Knowledge Engineering, AAAI-MAKE, # pages - 10, 2019. (Acceptance Rate: N/A)

12. Query Log Compression for Workload Analytics **Ting Xie** (PhD committee), Varun Chandola and Oliver Kennedy. Proceedings of the VLDB Endowment, 2019. (Acceptance Rate: 16.7%)
13. dynamicMF: A Matrix Factorization Approach to Monitor Resource Usage in High Performance Computing Systems. **Niyazi Sorkunlu** (PhD student), **Duc Thanh Anh Luong** (PhD student) and Varun Chandola. 6th IEEE International Conference on Big Data, BigData, 2018. (Acceptance Rate: 19.7%)
14. Entropy-Isomap: Manifold Learning for High-dimensional Dynamic Processes. **Frank Schoeneman** (PhD student), Varun Chandola, Nils Napp, Olga Wodo, and Jaroslaw Zola. 6th IEEE International Conference on Big Data, BigData, 2018. (Acceptance Rate: 19.7%)
15. Detecting Data Leakage from Databases on Android Apps with Concept Drift. **Gökhan Kul** (PhD student), Shambhu Upadhyaya and Varun Chandola. 17th IEEE International Conference On Trust, Security And Privacy In Computing And Communications, 2018. (Acceptance Rate: 30%)
16. S-Isomap++: Multi Manifold Learning from Streaming Data **Suchismit Mahapatra** and Varun Chandola. IEEE International Conference on Big Data (IEEE BigData), # pages - 10, 2017 (Acceptance Rate: 17.8%)
17. Tracking System Behavior from Resource Usage Data. **Niyazi Sorkunlu**, Varun Chandola, and Abani Patra. IEEE International Conference on Cluster Computing (IEEE Cluster), # pages - 9, 2017 (Acceptance Rate: 21.8%)
18. A k-means approach to clustering disease progressions. **Duc Luong** and Varun Chandola. International Conference on Health Informatics (ICHI), # pages - 7, 2017 (Acceptance Rate: 24%)
19. Automatic Extraction of Deep Phenotypes for Precision Medicine in Chronic Kidney Disease. **Prerna Chaudhary**, Varun Chandola, and Chet Fox. International Conference on Digital Health (ICDH), # pages - 10, 2017. (Acceptance Rate: N/A)
20. Error Metrics for Learning Reliable Manifolds from Streaming Data Frank Schoeneman, **Suchismit Mahapatra** (PhD student), Nils Napp, Varun Chandola, and Jaroslaw Zola. SIAM International Conference on Data Mining (SDM), # pages - 9, 2017. (Acceptance Rate: 25%)
21. Exploiting Hierarchy in Disease Codes - A Healthcare Application of Tree Structured Sparsity-Inducing Norms. **Jialiang Jiang** (PhD student), Sharon Hewner and Varun Chandola. In proceedings of the 12^{th} International Conference on Machine Learning and Data Mining, # pages - 15, 2016. (Acceptance Rate: N/A)
22. Modeling Graphs Using a Mixture of Kronecker Models. **Suchismit Mahapatra** (PhD student) and Varun Chandola. Proceedings of the 3^{rd} IEEE International Conference on Big Data, pages 727–736, 2015. (Acceptance Rate: 18.6%)
23. Surface Reconstruction from Intensity Image using Illumination Model based Morphable Modeling. **Zhi Yang** (PhD student) and Varun Chandola. Proceedings of 10^{th} International Conference on Computer Vision Systems (ICVS), pages 117–127, 2015. (Acceptance Rate: 50%)
24. Bringing Big Data from Space to Desktop. Varun Chandola and Patrick Hogan. Proceedings of the 2014 conference on Big Data from Space (BiDS'14), pages 233–235, 2014. (Acceptance Rate: N/A)
25. Knowledge Discovery from Massive Healthcare Claims Data. Varun Chandola, Sreenivas R. Sukumar, and Jack C. Schryver. Proceedings of the 19^{th} International ACM SIGKDD

Conference on Knowledge Discovery and Data Mining, pages 1312–1320, 2013. (Acceptance Rate: 17%)

26. Large Scale Remote Sensing Data Mining for Biomass Monitoring: Recent Advances and Future Challenges. Ranga R. Vatsavai, Varun Chandola, and Budhendra Bhaduri. Proceedings of 7^{th} International Conference on Geographic Information Science (GIScience), pages 2012. (Acceptance Rate: N/A)
27. iGlobe: An Interactive Visualization and Analysis Framework for Geospatial Data. Varun Chandola, Budhendra Bhaduri, and Ranga R. Vatsavai. Proceedings of 2^{nd} International Conference and Exhibition on Computing for Geospatial Research and Application (COM. Geo). 2011. (Acceptance Rate: 34%)
28. Machine Learning Approaches for High-resolution Urban Land Cover Classification. Ranga R. Vatsavai, Varun Chandola, Anil Cheriyadat, Edward Bright, Bhaduri Budhendra, and Jordan Grasser. Proceedings of 2^{nd} International Conference and Exhibition on Computing for Geospatial Research and Application (COM. Geo). 2011. (Acceptance Rate: 34%)
29. Rapid Damage Assessment using High-resolution Remote Sensing Imagery: Tools and Techniques. Ranga R. Vatsavai, Mark Tuttle, Budhendra Bhaduri, Edward Bright, Anil Cheriyadat, and Varun Chandola. Presented at International Geoscience and Remote Sensing Symposium (IGARSS). 2011. (Acceptance Rate: N/A)
30. A Gaussian Process Based Online Change Detection Algorithm for Monitoring Periodic Time Series. Varun Chandola and Ranga R. Vatsavai. Proceedings of SIAM International Conference on Data Mining (SDM). 2011. (Acceptance Rate: 25%)
31. Multi-temporal Remote Sensing Image Classification - A Multi-view Approach. Varun Chandola and Ranga R. Vatsavai. Proceedings of NASA Conference on Intelligent Data Understanding. 2010. (Acceptance Rate: N/A)
32. Scalable Time Series Change Detection for Biomass Monitoring Using Gaussian Process. Varun Chandola and Ranga R. Vatsavai. Proceedings of NASA Conference on Intelligent Data Understanding (CIDU). 2010. (**Selected as one of the top 6 best papers at the conference.**) (Acceptance Rate: N/A)
33. A Framework for Exploring Categorical Data. Varun Chandola, Shyam Boriah, and Vipin Kumar. Proceedings of 2009 SIAM Data Mining Conference. 2009. (Acceptance Rate: 15%)
34. Comparative Evaluation of Anomaly Detection Techniques for Sequence Data. Varun Chandola, Varun Mithal, and Vipin Kumar. Proceedings of 8^{th} International Conference on Data Mining (ICDM). 2008. (Acceptance Rate: 9.67%)
35. Similarity Measures for Categorical Data: A Comparative Evaluation, Shyam Boriah, Varun Chandola and Vipin Kumar. Proceedings of 8^{th} SIAM Data Mining Conference (SDM). 2008. (Acceptance Rate: 15.67%)
36. Summarization - Compressing Data into an Informative Representation. Varun Chandola and Vipin Kumar. Proceedings of 5^{th} International Conference on Data Mining (ICDM). 2005. (**Awarded one of the top 3 best student papers at the conference**). (Acceptance Rate: 13.8%)
37. WebGlobe - A cloud based geospatial analysis framework for interacting with climate data. **Arun Sharma**, **Syed Mohammed Arshad Zaidi**, Varun Chandola, Melissa R. Allen and Budhendra L. Bhaduri. In Proceedings of the 7th International Conference on Analytics for Big Geospatial Data (BigSpatial), 2018.

38. Exploiting Hierarchy in Disease Codes - A Healthcare Application of Tree Structured Sparsity-Inducing Norms. **Jialiang Jiang** (PhD student), Sharon Hewner and Varun Chandola. In Proceedings of the SDM Workshop on Data Mining for Medicine and Healthcare, 2016.
39. Ettu: Analyzing Query Intents in Corporate Databases. Gökhan Kul, **Duc Luong** (PhD student), Ting Xie, Patrick Coonan, Varun Chandola, Oliver Kennedy and Shambhu Upadhyaya. In Proceedings of the WWW Workshop on Empirical Research Methods in Information Security, 2016.
40. A Big Data Approach to Rumor Mitigation in Twitter Microblog: A Case of Boston Bombings. Rohit Valecha (PhD student), Ankit Sultania (MS student), Varun Chandola, Manish Agrawal and H. Raghav Rao. Proceedings of the 13^{th} Workshop on e-Business (WeB), 2015.
41. Development of a computational and data-enabled science and engineering Ph.D. program. Paul T. Bauman, Varun Chandola, Abani Patra and Matthew Jones Proceedings of SC EduHPC Workshop, 2014.
42. Spatiotemporal Data Mining in the Era of Big Spatial Data: Algorithms and Applications. Ranga R. Vatsavai, Varun Chandola, Scott Klasky, Auroop Ganguly, Anthony Stefanidis, Shashi Shekhar. Proceedings of 1^{st} International Workshop on Analytics for Big Geospatial Data (BigSpatial). 2012.
43. Implementing a Gaussian Process Learning Algorithm in Mixed Parallel Environment. Varun Chandola and Ranga R. Vatsavai. Proceedings of Super computing (SC) Workshop on Latest Advances in Scalable Algorithms for Large-Scale Systems (ScalA). 2011.
44. Using Time Series Segmentation for Deriving Vegetation Phenology Indices from MODIS NDVI Data. Varun Chandola, Dafeng Hui, Lianhong Gu, and Ranga R. Vatsavai. Proceedings of 1^{st} ICDM Workshop on Knowledge Discovery from Climate Data: Prediction, Extremes, and Impacts. 2010.
45. An In Depth Scalability Analysis of a Gaussian Process Training Algorithm. Varun Chandola and Ranga R. Vatsavai. Proceedings of Super Computing (SC) Workshop on Latest Advances in Scalable Algorithms for Large-Scale Systems (ScalA). 2010.
46. Scalable Hyper-parameter Estimation for Gaussian Process Based Time Series Analysis. Varun Chandola and Ranga R. Vatsavai. Proceedings of 4^{th} SIGKDD Workshop on Large-scale Data Mining: Theory and Applications (LDMTA). 2010.
47. A Reference Based Analysis Framework for Analyzing System Call Traces. Varun Chandola, Shyam Boriah, and Vipin Kumar. Proceedings of 6^{th} Annual Cyber Security and Information Intelligence Research Workshop (CSIIRW). 2010.
48. DDDAS/ITR: A Data Mining and Exploration Middleware for Grid and Distributed Computing. Jon B. Weissman, Vipin Kumar, Varun Chandola, Eric Eilertson, Levent Ertoz, Gyorgy Simon, Seonho Kim, and Jinoh Kim. Proceedings of Workshop on Dynamic Data Driven Application Systems - DDDAS. 2007.

Proceedings Articles

1. Analyzing Big Spatial & Big Spatiotemporal Data: A Case Study of Methods and Applications. Varun Chandola, Ranga R. Vatsavai, Devashish Kumar, and Auroop Ganguly. Big Data Analytics, eds. Vijay Raghavan, Calyumpadi R. Rao and Venu Govindaraju, Elsevier Publications, 2015.
2. Fraud Detection in Healthcare. Varun Chandola, Sreenivas R. Sukumar, and Jack C. Schryver.

Healthcare Data Analytics, eds. Chandan Reddy and Charu Aggarwal. 2014.

3. Data Analysis for Real Time Identification of Grid Disruptions. Varun Chandola, Omitaomu Olufemi and Steve N. Fernandez. Computational Intelligent Data Analysis for Sustainable Development, eds. Ting Yu, Nitesh Chawla, and Simeon Simoff, Taylor and Francis. 2012.
4. Data Mining for Cyber Security. Varun Chandola, Eric Eilertson, Levent Ertoz, Gyorgy Simon and Vipin Kumar. Data Warehousing and Data Mining Techniques for Computer Security, ed. Anoop Singhal, Springer. 2006.
5. Anomaly Detection: A Modern Perspective. Varun Chandola, Arindam Banerjee, and Vipin Kumar. Encylopedia of Machine Learning and Data Mining. 2016.
6. Virtualization of Evolving Power Grid. Olufemi Omitaomu, Varun Chandola, and Alexander Sorokine. IEEE Smart Grid Newsletter. 2012.
7. Knowledge discovery from sensor data (SensorKDD). Varun Chandola, Olufemi Omitaomu, Auroop Ganguly, Ranga R. Vatsavai, Nitesh Chawla, Joao Gama, and Mohamed Gaber. SIGKDD Explorations Newsletter. 2011.

INVITED TALKS

1. Panel - Driving Innovation with National Cyberinfrastructure Investment (Panel). 27th Annual International Conference on Digital Government Research, June 2026, Omaha, NE.
2. Integrating AI with Quantum-Enhanced Ramanomics. The 2026 Multifunctional Materials, Photonics, Bioscience, and Artificial Intelligence International Workshop, IISER Trivandrum, March 2026, Trivandrum, India.
3. About National AI Research Resource (NAIRR) Pilot. Institute for Artificial Intelligence and Data Science (IAD) Tech Exchange Seminar, October 2025, Buffalo, NY.
4. Strengthening and democratizing the U.S. Artificial Intelligence Innovation Ecosystem through the National AI Research Resource Pilot. FutureTech Workshop on The Role of AI in Science, November 2024, Cambridge, MA.
5. Keynote - National AI Research Resource (NAIRR) Pilot Program. 2024 MetroLab Summit, October 2024, Washington, DC.
6. Keynote - Software and Data Cyberinfrastructure Opportunities at the National Science Foundation. 22nd International Workshop on Data Mining in Bioinformatics Held in conjunction with SIGKDD 2023, August 2023, Washington, DC.
7. Towards a Robust Artificial Intelligence Innovation Ecosystem. Penn State AI Hub Talks, February 2023, Penn State University, PA.
8. Opening remarks - National Science Foundation. 2023 DARWIN Computing Symposium, February 2023, University of Delaware, DE.
9. Keynote - Spatio-temporal Data Mining: Research and Funding Opportunities. 17th International Workshop on Spatial and Spatiotemporal Data Mining (SSTDM-22), December 2022, Orlando, FL.
10. Overview of the NSF Office of Advanced Cyberinfrastructure and its current programs and investments. Distinguished Speaker Series - Computer Science and Engineering, November 2022, Ohio State University, OH.
11. An Ensemble-Based Deep Framework for CHEMistry TABulation in Turbulent Combustion Problems. USACM Thematic Conference on Uncertainty Quantification for Machine Learning

Integrated Physics Modeling (UQ-MLIP), August 2022, Arlington, VA.

12. Keynote - Predicting Individual Mobility Patterns From Mobile Phone GPS Data. 16th International Workshop on Spatial and Spatiotemporal Data Mining (SSTDM-21), December 2021, Auckland, NZ.
13. Anomaly detection and clustering for evolving data streams. The Second Artificial Intelligence for Robust Engineering and Science Workshop (AIRES 2), February 2021, Oak Ridge, TN.
14. Artificial Intelligence. Garret Club Lecture and Seminar Series, November 2019, Buffalo, NY.
15. Extracting Deep Phenotypes from Clinical Data. Machine Learning and Data Science Seminar, Icahn School of Medicine at Mount Sinai, May 2019, New York City, NY.
16. Anomaly Detection. Data Science Winter School, Chennai Mathematical Institute, December 2018, Chennai, India.
17. Artificial Intelligence. Lumsden McCormick 24th Annual Exempt Organizations Conference, November 2018, Buffalo, NY.
18. Anomaly Detection. 7th International Program on Information Assurance and Management, IPIAM, September 2018, Buffalo, NY.
19. How much data? Putting an upper bound on data size for reliable learning. Rochester Institute of Technology AI Seminar Series, March 2018, Rochester, NY.
20. Applications of Machine Learning in Precision Medicine. CTSI Informatics Analytics Cluster Colloquium, November, 2017, Rochester, NY.
21. Optimization Based Methods for Anomaly Detection. Syracuse University EECS/CASE Colloquium, October 2016, Syracuse, NY.
22. Optimization Based Methods for Anomaly Detection. RIT Software Engineering Department Colloquium, October 2016, Rochester, NY.
23. Anomaly Detection. 6th International Program on Information Assurance and Management, IPIAM, September 2017, Niagara Falls, NY.
24. Data Driven Fraud Detection. 1st International Program on Data Analytics for Banking and Financial Institutions., May 2017, Buffalo, NY.
25. Scaling Non-linear Dimensionality Reduction Methods to Handle Massive Data Streams. 7th SC Workshop on Big Data Analytics. November, 2016, Salt Lake City, UT.
26. Anomaly Detection. 5th International Program on Information Assurance and Management, IPIAM, September 2016, Niagara Falls, NY.
27. Finding Anomalies via Message Passing. CDSE Days Invited Talk. April 2016.
28. Accelerating Gaussian Process Based Statistical Methods for Spatio-temporal Analysis. International Indian Statistical Association Conference, December 2015, Pune, India.
29. Scaling Gaussian Process Analysis for Big Spatiotemporal Data. 10^{th} International Workshop on Spatial and Spatiotemporal Data Mining (SSTDM), November 2015, Atlantic City, NJ.
30. Open source tools for Geospatial Analysis. Google Developer Group DevFest, October 2015, Buffalo, NY.
31. Anomaly Detection. 4th International Program on Information Assurance and Management, IPIAM, September 2015, Niagara Falls, NY.
32. IGlobe: Bringing Big Data from Space to Desktop. 36^{th} Annual Symposium on Remote Sensing

of the Environment, ISRSE, May 2015, Berlin, Germany.

33. Data Science for Social Good - Lessons Learned and Future Directions. Buffalo Big Data Meetup, October 2014, Buffalo, NY.
34. Anomaly Detection. 3rd International Program on Information Assurance and Management, IPIAM, September 2014, Niagara Falls, NY.
35. Large Scale Machine Learning for Massive Remote Sensing Data — A Case Study in Biomass Monitoring. ASPRS Annual Meeting. March 2013, Baltimore, MD.
36. iGlobe: Bridging the Gap Between Weather and GIS. NASA World Wind Department of Defense Apps Meeting. October 2012, Washington, DC.
37. iGlobe: Bringing Weather to WorldWind for Interactive Analysis. NASA World Wind Department of Defense Apps Meeting. March 2012, Mountain View, CA.
38. High Performance Spatiotemporal Data Mining. US Department of Energy Fall Creek Falls Meeting. October 2010, Memphis, TN.
39. Anomaly Detection for Symbolic Sequences. NASA Conference on Intelligent Data Understanding. September 2008, Washington, D.C.

COURSES TAUGHT

- *CSE 676* - Deep Learning Spring 2026 (38 students)
- *CSE 111* - Introduction to Quantitative Analysis and Reasoning with Computing Fall 2025 (18 students)
- *CSE 474* - Introduction to Machine Learning Spring 2018 (113 students), Spring 2019 (146 students)
- *CSE 474/574* - Introduction to Machine Learning Spring 2014 (145 students), Spring 2015 (220 students), Spring 2016 (233 students), Spring 2017 (281 students), Spring 2020 (274 students)
- *CSE 610* - Bayesian Non-parametric Machine Learning Fall 2020 (27 students)
- *CSE 740* - Large Scale Machine Learning and Big Data Fall 2013 (20 students), Fall 2014 (20 students), Fall 2015 (24 students), Fall 2016 (22 students), Fall 2018 (18 students), Fall 2019 (9 students)
- *EAS 503* - Programming and Database Fundamentals for Data Science Fall 2017 (28 students), Fall 2018 (60 students), Fall 2019 (72 students)

STUDENTS ADVISED

Dissertations/Theses Directed

1. Zhi Yang (PhD: 2015, First appointment: Continental Vision)
2. Suchismit Mahapatra (PhD: 2018, Current appointment: Meta AI)
3. Duc Thanh Anh Luong (PhD: 2018, First appointment: Cruise)
4. Jialiang Jiang (PhD: 2020, First appointment: AirBnB)
5. Syed Mohammed Arshad Zaidi (PhD: 2021, First appointment: Expedia)
6. Sreelekha Guggilam (CDSE) (PhD: 2022, Current appointment: TAMU Corpus Christi)
7. Amol Salunkhe (CDSE) (PhD: 2022, Current appointment: American Express)
8. Pranav Sankhe (PhD: 2023, First appointment: Oak Ridge National Laboratory)

Dissertations/Theses in Progress

1. Namit Juneja, PhD, August 2019–present, degree expected September 2026.
2. Dwyer Deighan, PhD (CDS&E), August 2022–present, degree expected September 2026.
3. Saumya Pandey, PhD (CDS&E), August 2023–present, degree expected September 2027.
4. Tanvi Ranga, PhD, August 2025–present, degree expected September 2028.
5. Vikram Velankar, PhD, August 2026–present, degree expected September 2029.

Dissertation/Thesis Committee Member

- Nikhil Londhe
- Tao Wei
- Gang Chen
- Radhakrishna Dasari
- Subhadeep Karan
- Frank Schoeneman
- Prashant Shekhar (CDSE)
- Yan Sun
- Yaliang Li
- Shounak Gore
- Devansh Arpit
- Suzanne Sullivan (Nursing)
- Ruhan Sa
- Bhargava Urala
- Lu Meng
- Joseph Marziale (CDSE)
- Neeti Narayan
- Rohit Valecha (School of Management)
- Chris Bang (School of Management)
- Michael Vaiana (CDSE)
- Gokhan Kul
- Ting Xie
- Hayreddin Ceker
- Rathin Radhakrishnan Nair
- Houping Xiao
- Ali Reza (ISE)
- Alex Foss (Biostatistics)
- Shebuti Rayana (CSE/Stonybrook U.)
- Krithika Krishnan (CDSE)
- Nagashri Lakshminarayana
- Xiomei Wang (ISE)
- Md. Azharul Islam (MAE)

PROFESSIONAL SERVICE

Departmental / School / University Committees

- UB AI Asset Governance Committee Member (2025 -)
- Computer Science & Engg., UB
  - Graduate Affairs Committee Co-chair (2026 -)
  - Department Executive Committee (2026 -)
  - Documentation and Governance Committee (2025 -)
  - Faculty Search Committee (2018)
  - Graduate Admissions Committee (2014, 2015)
  - Facilities Committee (2015)
  - Graduate Studies Committee (2015)
  - Student Awards Committee (2015, 2016, 2017)
  - Colloquium Committee (2014, 2016)
- Computational and Data Enabled Science & Engg., UB
  - Director of Graduate Studies (2019-2021)
  - Curriculum Committee (2014-2021)
  - SEAS M. Eng. in Data Science Planning Committee (2017-2021)

- CDSE Outreach Committee (2015-2021)
- Biostatistics Big Data Faculty Search Committee (2015-2017)

Invited Panelist

- Invited panelist for NSF CSSI, NSF BigData, NSF IIS, NSF SaTC, and DOE ASCR.
- Invited panelist for ORNL LDRD program, 2017.
- Invited reviewer for Sembcorp-EMA Energy Technology Partnership (SEETP) R&D Proposals for the Energy Market Authority of Singapore, 2015.
- Invited reviewer for Dutch Technology Foundation STW research proposals, 2014, 2016.

Mentor Service

- Mentor for Collegiate Science and Technology Entry Program at University at Buffalo, June – August, 2019.
- Mentor for Data Science for Social Good summer fellowship at University of Chicago, June – August, 2014.
- Mentor in the SUNY Louis Stokes Alliance for Minority Participation (SUNY-LSAMP) program, June – August, 2014.

Editorial Service

- Guest Editor for special issue: "Algorithms for Manifold Learning and Its Applications", Algorithms.
- Guest Editor for special issue: "Big Spatial Data", Geoinformatica.
- Coordinating Editor for "Information Systems Frontiers", Springer.
- Guest Associate Editor for special issue: "Information Fusion, Data Analysis, and Knowledge Discovery in Hybrid Networks", Journal of Computer Networks and Communications.

Referee Service

- ACM Computing Surveys
- ACM Transactions on Knowledge and Data Discovery
- IEEE Transactions on Knowledge and Data Engineering
- IEEE Transactions on Signal Processing
- SIAM Statistical Analysis and Data Mining
- PLOS One Journal
- Springer Machine Learning
- Nature Scientific Reports
- Journal of Machine Learning Research
- Data Mining and Knowledge Discovery
- Knowledge and Information Systems
- International Journal of Geographical Information Science
- Pattern Recognition
- Journal of Artificial Intelligence Research
- IEEE IET Information Security

- IEEE Systems, Man and Cybernetics, Part B
- IEEE Transactions on Parallel and Distributed Systems
- Applied Stochastic Models in Business and Industry
- Journal of Aerospace Information Systems

Organization Committees

- IEEE iSES 2020
- AGU 2018, Fall Meeting Session Organizer
- CDSE Days Workshop (2014-2018)
- ICDM 2015 (Sponsorship Chair)
- BigSpatial 2012-2019 (Workshop Co-chair)
- ACS 2012, ACS 2013 (Workshop Co-chair)
- SensorKDD 2010, SensorKDD 2012, SensorKDD 2013 (Workshop Co-chair)
- PDAC 2011, PDAC 2012, PDAC 2013 (Publicity Chair)
- SSTDM 2011, SSTDM 2012, SSTDM 2013 (Government, Industry, and Publicity Chair)
- KDCloud 2014 (Workshop Co-chair)
- KDCloud 2011, KDCloud 2012, KDCloud 2013 (Government, Industry, and Publicity Chair)

Senior Program Committees

- SDM 2012, SDM 2014

Program Committees

- NeurIPS 2020-present
- ICML 2022-present
- AAAI 2019-present
- ICLR 2019-present
- KDD 2019-present
- PAL 2018
- DASFAA 2016, 2021
- CIKM 2014, CIKM 2015, CIKM 2016, CIKM 2017
- IT-OT Analytics 2015
- HINA 2015
- BigData 2013
- SDM 2013
- ICRA 2012, ICRA 2013
- CIDU 2012
- PAKDD 2012
- Clim-KD 2011