KAUSHIK ROY

THE UNIVERSITY OF ALABAMA

Assistant Professor / Department of Computer Science

3031 Cyber Hall · Tuscaloosa, AL

kroy2@ua.edu · (205) 348-2171

kauroy1994.github.io/home/

ORCID 0000-0001-6610-7845

01 ACADEMIC APPOINTMENT

2025–present	Assistant Professor · Department of Computer Science, The University of Alabama

02 EDUCATION

2025	Ph.D., Computer Science and Engineering · University of South Carolina Dissertation: Process-Grounded Knowledge-Infused Learning and Decision Making Advisor: Amit P. Sheth
2017	M.S., Computer Science · Indiana University Bloomington
2015	B.E., Computer Science · R. V. College of Engineering, Bengaluru

03 RESEARCH INTERESTS

Neurosymbolic AI · Knowledge representation · Process-grounded and causal reasoning · Trustworthy agentic systems · Explainable AI · Healthcare AI · Sequential decision-making

04 AWARDS AND RESEARCH FUNDING

	AI for Services LLC · Industry research award · USD 21,975
2026	SCoE CORE Equipment Funding · The University of Alabama, College of Engineering · $30,000 collaborative equipment award
2023–2025	NSF EAGER #2335967 · Knowledge-Guided Neurosymbolic AI with Guardrails for Safe Virtual Health Assistants · Research contributor
2022–2024	NSF EAGER #2133842 · Advancing Neurosymbolic AI with Deep Knowledge-Infused Learning · Research contributor

05 PUBLICATIONS

JOURNAL ARTICLES

01 Roy, K., Surana, H., Eswaramoorthi, D., Zi, Y., Palit, V., Garimella, R., & Sheth, A. (2026). Exploring the Potential of Large Language Models for Assisting with Mental Health Diagnostic Assessments. ACM Transactions on Computing for Healthcare, 7(3), Article 58.

02 Ramnani, S., Roy, K., & Sheth, A. (2026). MATRIX: Mental heAlth diagnostics Through Real time Intelligent unified X-AI attribution reasoning. Frontiers in Digital Health, 7, 1621271.

03 Chattopadhyay, A., Dandekar, R., & Roy, K. (2026). Metatuning: An Empirical Study of Judge-Guided Prompt Refinement and Its Boundary Conditions. Neurosymbolic Artificial Intelligence, 2.

04 Zi, Y., Roy, K., & Sheth, A. (2025). Cognitive Neurosymbolic Artificial Intelligence for Complex Decision-Making: Integrating Foundation Models, Cognitive Architectures, and Knowledge. IEEE Intelligent Systems.

05 Sheth, A. P., Roy, K., Venkataramanan, R., Nadimuthu, V., & Shyalika, C. (2025). Composite AI With Custom, Compact, Neurosymbolic Models: The Emergent Enterprise Artificial Intelligence Paradigm. IEEE Internet Computing, 29(2), 37–49.

06 Sheth, A., Khandelwal, V., Roy, K., Pallagani, V., & Chakraborty, M. (2025). NeuroSymbolic Knowledge-Grounded Planning and Reasoning in Artificial Intelligence Systems. IEEE Intelligent Systems.

07 Venkataramanan, R., Tripathy, A., Kumar, T., Serebryakov, S., Justine, A., Shah, A., Bhattacharya, S., Foltin, M., Faraboschi, P., Roy, K., & Sheth, A. (2025). Constructing a Metadata Knowledge Graph as an Atlas for Demystifying AI Pipeline Optimization. Frontiers in Big Data, 7, 1476506 (published Jan. 7, 2025).

08 Sheth, A., Roy, K., Purohit, H., & Das, A. (2024). Civilizing and Humanizing Artificial Intelligence in the Age of Large Language Models. IEEE Internet Computing, 28(5).

09 Sheth, A., Pallagani, V., & Roy, K. (2024). Neurosymbolic AI for Enhancing Instructability in Generative AI. IEEE Intelligent Systems, 39(5), 5–11.

10 Roy, K. (2024). Healthcare Assistance Challenges-Driven Neurosymbolic AI. Biomedical Journal of Scientific & Technical Research, 58(2).

11 Shyalika, C., Roy, K., Prasad, R., El Kalach, F., Zi, Y., Mittal, P., Narayanan, V., Harik, R., & Sheth, A. (2024). RI2AP: Robust and Interpretable 2D Anomaly Prediction in Assembly Pipelines. Sensors, 24(10), 3244.

12 Sheth, A., & Roy, K. (2024). Neurosymbolic Value-Inspired Artificial Intelligence (Why, What, and How). IEEE Intelligent Systems, 39(1), 5–11.

13 Sheth, A., Roy, K., & Gaur, M. (2023). Neurosymbolic Artificial Intelligence (Why, What, and How). IEEE Intelligent Systems, 38(3), 56–62.

14 Roy, K., Gaur, M., Soltani, M., Rawte, V., Kalyan, A., & Sheth, A. (2023). ProKnow: Process Knowledge for Safety Constrained and Explainable Question Generation for Mental Health Diagnostic Assistance. Frontiers in Big Data, 5, 1056728.

15 Sheth, A., Gaur, M., Roy, K., Venkataramanan, R., & Khandelwal, V. (2022). Process Knowledge-Infused AI: Toward User-Level Explainability, Interpretability, and Safety. IEEE Internet Computing, 26(5), 76–84.

16 Sheth, A., Gaur, M., Roy, K., & Faldu, K. (2021). Knowledge-Intensive Language Understanding for Explainable AI. IEEE Internet Computing, 25(5), 19–24.

CONFERENCE PAPERS AND DEMONSTRATIONS

01 Garimella, R., Roy, K., Shyalika, C., & Sheth, A. (2026). In-Situ Eval: A Modular Framework for Custom and Real-Time RAG Benchmarking. Proceedings of the AAAI Conference on Artificial Intelligence, 40(48), 41586–41588 (Demonstrations).

02 Tripathi, H., Roy, K., Neupane, S., & Rahimi, S. (2026). How Compliant Is Sepsis Treatment? An Expert-Guided Neuro-Symbolic Pipeline for Generating Clinical Compliance Insights. NeSy 2026.

03 Chattopadhyay, A., Dandekar, R., & Roy, K. (2025). Learning and Reasoning with Model-Grounded Symbolic Artificial Intelligence Systems. Proceedings of the 19th International Conference on Neurosymbolic Learning and Reasoning (NeSy), PMLR 284, 957–976.

04 Tiwari, A., Sinan, M., Roy, K., Sheth, A., Saha, S., & Bhattacharyya, P. (2024). Towards a Contextualized and Semantics Infused Dialogue Generation Loss Function and Evaluation Metric. ECML PKDD 2024, 342–360.

05 Pallagani, V., Muppasani, B. C., Roy, K., Fabiano, F., Loreggia, A., Murugesan, K., Srivastava, B., Rossi, F., Horesh, L., & Sheth, A. (2024). On the Prospects of Incorporating Large Language Models in Automated Planning and Scheduling. Proceedings of the International Conference on Automated Planning and Scheduling (ICAPS), 34, 432–444.

06 Roy, K., Khandelwal, V., Vera, V., Surana, H., Heckman, H., & Sheth, A. (2024). GEAR-Up: Generative AI and External Knowledge-Based Retrieval: Upgrading Scholarly Article Searches for Systematic Reviews. Proceedings of the AAAI Conference on Artificial Intelligence, 38(21), 23823–23825.

07 Venkataramanan, R., Roy, K., Raj, K., Prasad, R., Zi, Y., Narayanan, V., & Sheth, A. (2023). Cook-Gen: Robust Generative Modeling of Cooking Actions from Recipes. IEEE International Conference on Systems, Man, and Cybernetics (SMC), 981–986.

08 Roy, K., Garg, T., Palit, V., Zi, Y., Narayanan, V., & Sheth, A. (2023). Knowledge Graph Guided Semantic Evaluation of Language Models for User Trust. IEEE Conference on Artificial Intelligence (CAI), 234–236.

09 Roy, K., Khandelwal, V., Goswami, R., Dolbir, N., Malekar, J., & Sheth, A. (2023). Demo Alleviate: Demonstrating Artificial Intelligence Enabled Virtual Assistance for Telehealth: The Mental Health Case. Proceedings of the AAAI Conference on Artificial Intelligence, 37(13), 16479–16481.

10 Gaur, M., Roy, K., Sharma, A., Srivastava, B., & Sheth, A. (2021). Who Can Help Me?: Knowledge Infused Matching of Support Seekers and Support Providers During COVID-19 on Reddit. IEEE International Conference on Healthcare Informatics (ICHI), 265–269.

11 Roy, K., Zhang, Q., Gaur, M., & Sheth, A. (2021). Knowledge-Infused Policy Gradients with Upper Confidence Bound for Relational Bandits. ECML PKDD 2021, 35–50.

12 Chaudhuri, S. K., Kleppinger, J. W., Nag, R., Roy, K., Panta, R., Agostinelli, F., Sheth, A., Roy, U. N., James, R. B., & Mandal, K. C. (2021). A CdZnTeSe Gamma Spectrometer Trained by Deep Convolutional Neural Network for Radioisotope Identification. Proceedings of SPIE: Hard X-Ray, Gamma-Ray, and Neutron Detector Physics XXIII, 11838.

13 Bhat, A., & Roy, K. (2016). Optimized KNN for Sequential Execution. International Conference on Inventive Computation Technologies (ICICT), 1–6.

14 Nasreen, A., Roy, K., Roy, K., & Shobha, G. (2015). Key Frame Extraction and Foreground Modelling Using K-Means Clustering. International Conference on Computational Intelligence, Communication Systems and Networks, 141–145.

15 Bhat, A. G., Roy, K., Anchalia, P. P., & Jeevith, H. M. (2015). Design and Implementation of a Dynamic Intelligent Traffic Control System. UKSim-AMSS International Conference on Modelling and Simulation, 369–373.

16 Anchalia, P. P., Roy, K., & Roy, K. (2015). Two Class Fisher's Linear Discriminant Analysis Using MapReduce. UKSim-AMSS International Conference on Modelling and Simulation, 463–469.

17 Anchalia, P. P., & Roy, K. (2014). The K-Nearest Neighbor Algorithm Using MapReduce Paradigm. International Conference on Intelligent Systems, Modelling and Simulation, 513–518.

SYMPOSIUM AND WORKSHOP PAPERS

01 Roy, K., Zi, Y., & Sheth, A. (2024). Towards Pragmatic Temporal Alignment in Stateful Generative AI Systems: A Configurable Approach. AAAI Symposium Series, 4(1), 388–390.

02 Roy, K., Oltramari, A., Zi, Y., Shyalika, C., Narayanan, V., & Sheth, A. (2024). Causal Event Graph-Guided Language-Based Spatiotemporal Question Answering. AAAI Symposium Series, 3(1), 227–233.

03 Zi, Y., Roy, K., Narayanan, V., & Sheth, A. (2024). Exploring Alternative Approaches to Language Modeling for Learning from Data and Knowledge. AAAI Symposium Series, 3(1), 279–286.

04 Raj, K., Roy, K., Bonagiri, V., Govil, P., Thirunarayan, K., Goswami, R., & Gaur, M. (2024). K-PERM: Personalized Response Generation Using Dynamic Knowledge Retrieval and Persona-Adaptive Queries. AAAI Symposium Series, 3(1), 219–226.

05 Shiri, A., Roy, K., Sheth, A., & Gaur, M. (2024). L3 Ensembles: Lifelong Learning Approach for Ensemble of Foundational Language Models. ACM CoDS-COMAD Young Researchers Symposium, 592–594.

06 Zi, Y., Veeramani, H., Roy, K., & Sheth, A. (2023). RDR: The Recap, Deliberate, and Respond Method for Enhanced Language Understanding. NeSy / OpenReview Workshop.

07 Roy, K., Zi, Y., Gaur, M., Malekar, J., Zhang, Q., Narayanan, V., & Sheth, A. (2023). Process Knowledge-Infused Learning for Clinician- Friendly Explanations. AAAI Symposium Series, 1(1), 154–160.

08 Tsakalidis, A., Chim, J., Bilal, I. M., Zirikly, A., Atzil-Slonim, D., Nanni, F., Resnik, P., Gaur, M., Roy, K., Inkster, B., Leintz, J., & Liakata, M. (2022). Overview of the CLPsych 2022 Shared Task: Capturing Moments of Change in Longitudinal User Posts. Workshop on Computational Linguistics and Clinical Psychology, 184–198.

09 Gupta, S., Agarwal, A., Gaur, M., Roy, K., Narayanan, V., Kumaraguru, P., & Sheth, A. (2022). Learning to Automate Follow-up Question Generation Using Process Knowledge for Depression Triage on Reddit Posts. Workshop on Computational Linguistics and Clinical Psychology, 137–147.

10 Roy, K., Rawte, V., Chakraborty, M., Gaur, M., Faldu, K., Kikani, P., et al. (2022). TDLR: Top Semantic-Down Syntactic Language Representation. NeurIPS Workshop on All Things Attention.

11 Lokala, U., Lamy, F., Dastidar, T. G., Roy, K., Daniulaityte, R., Parthasarathy, S., & Sheth, A. (2021). eDarkTrends: Harnessing Social Media Trends in Substance Use Disorders for Opioid Listings on Cryptomarket. ICLR Workshop on AI for Public Health.

BOOK CHAPTERS

01 Roy, K., Wu, S., & Oltramari, A. (2025). Enhancing Foundation Model-Based Reasoning with Neuro-Symbolic Cognitive Methods. Handbook on Neurosymbolic AI and Knowledge Graphs, IOS Press.

02 Roy, K., Gaur, M., Soltani, M., Rawte, V., Kalyan, A., & Sheth, A. (2024). ProKnow: Process Knowledge for Safety Constrained and Explainable Question Generation for Mental Health Diagnostic Assistance in the Age of Large Language Models. Science and Technology – Recent Updates and Future Prospects, Vol. 2.

PREPRINTS

01 Tripathi, H., Roy, K., Rahimi, S., Neupane, S., & Bozorgzad, S. (2026). From Protocol to Practice: Graded Sepsis Bundle Compliance and Actionable Insights from Real-World ICU Data. medRxiv. DOI: 10.64898/2026.04.23.26351412.

06 TEACHING AND MENTORING

Spring 2027	CS 483/583 · Computational Foundations of Machine Learning · The University of Alabama
Fall 2026	CS 696 · Graduate Research Mentoring · 3 credits · The University of Alabama
Spring 2026	CS 691 · Special Topics: Neurosymbolic Artificial Intelligence · The University of Alabama
Doctoral advising	Ashraf Abdul-Muumin · Department of Computer Science, The University of Alabama

07 ACADEMIC SERVICE

EDITORIAL APPOINTMENTS

Guest Editor · IEEE Internet Computing · Civilizing and Humanizing AI

Guest Editor · Information · Methods for Integrating Information in Data, Language Models, and Knowledge Graphs for Neurosymbolic Learning and Reasoning

EVENT ORGANIZATION AND PROGRAM COMMITTEES

2026	Program Committee · CNLP4QoL Workshop, IEEE ICHI; TRUSTMORE Workshop, IEEE BigData
2025	Program Committee · CLPsych
2024	Program Committee · KiL Workshop, ACM KDD; Tutorial Organizer · ISWC
2023	Organizing Committee · Knowledge-infused Learning Workshop, ACM KDD; Tutorial Organizer · The Web Conference
2020	Program Committee · KiML Workshop, ACM KDD

PEER REVIEW

Neurosymbolic Artificial Intelligence (2024–2026) · COLING 2025 System Demonstrations

08 INVITED TALKS AND TUTORIALS

Nov 20, 2026	Keynote: Beyond Pattern Recognition: Towards Reasoning, Explainability, and Autonomy in Artificial Intelligence · AICCT 2026, Amity University Madhya Pradesh
2026	Task-dependent Meta-cognition for General Classes of Problems · University of South Carolina
2025	AI in Healthcare · University of South Carolina
2024	Healthcare Assistance Challenges-Driven Neurosymbolic AI · Ontolog Summit; Knowledge-infused Neurosymbolic AI for Mental Healthcare · University of Florida; Neurosymbolic Customized and Compact CoPilots · ISWC
2023	Causal AI for Web and Health Care · The Web Conference
2022	Knowledge-infused Reinforcement Learning · Knowledge Graph Conference

2020 Knowledge-infused Statistical Learning for Social Good · PyData Berlin