

AISHA AIJAZ

Ph.D. CSE, KRACR Lab, IIIT Delhi

*Responsible ML/AI | Artificial Moral Agents |
Social Ontologies | Human Alignment*

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Highlights

- **Ph.D. (Computer Science Engineering) scholar at IIITD**, developing a framework for ethical cognition in AI decision-making systems using a neurosymbolic approach.
- **Research interests** include general cognition in AI systems, AI safety, trustworthy, responsible, and morally-aligned AI, semantic web technologies, ontology development, knowledge graphs and representation, neurosymbolic techniques, general ML/AI, and applied and normative ethical philosophy.
- **Seven years of research, teaching, and industry experience** in AI, data science, and data analytics in the UAE, Bahrain, and India.

Education

- **Ph.D. in Computer Science and Engineering (2021-2026) at IIIT Delhi**
CGPA 8.54
Thesis Title: *Framework for Ethical Cognition in AI Systems: Rule-based, Data-Driven, and Algorithmic Approaches*
- **M.Sc. in Data Science (2018-2019) at Heriot-Watt University**
With Distinction, CGPA 8.21
Dissertation Title: *A Comparative Study on OCR for Very Different Scripts: English, Arabic, Hindi*
- **B.Tech. in Computer Science and Engineering (2014-18) at Jamia Millia Islamia**
First Division with Honours, CGPA 8.82
Bachelor Thesis Project: *Automatic Sleep Stage Scoring from Single-Channel EEG using Ensemble Learning*

Work Experience

- Visiting Intern at Department of NLP, MBZUAI, Abu Dhabi. (March - May 2025).
- Intern at Web Science Lab, IIIT-Bangalore. (Nov 2024 - Jan 2025).
- Teaching Assistant at IIIT-Delhi for Data Structures and Algorithms (DSA), Ethical AI Systems (EAI), and Operating Systems (OS) as Head TA. (Aug 2022 - Present).
- Data Specialist at Gulf Researcher, Bahrain. (July 2021 - Jan 2022).
- Research Assistant at Royal University of Women, Bahrain. (Feb 2021 - July 2021).
- Private Instructor; Subjects included Data Science, High-Performance Computing, Big Data Analytics, Data Mining, and Research Methods. (Dec 2020 - Sept 2021).
- Data Analyst, VLCC Beauty and Wellness Pvt. Ltd. (GCC HQ), Dubai, UAE. (May - Oct 2019).

Research

- **Published:**
 - ◇ **Aijaz, A.**, Batra, A., Bazaz, A., Srinivasa, S., Mutharaju, R. and Kumar, M., 2025, August. Moral Compass: A Data-Driven Benchmark for Ethical Cognition in AI. In Proceedings of the Thirty-Fourth International Joint Conference on Artificial Intelligence, IJCAI 2025, AI and Social Good. Pages 9529-9537. <https://doi.org/10.24963/ijcai.2025/1059>
 - ◇ **Aijaz, A.**, 2024. Bridging Ethics and AI: A Path to Moral Machines. In Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society (Vol. 7, No. 2, pp. 2-4). <https://doi.org/10.1609/aies.v7i2.31892>

- ✧ **Aijaz, A.**, 2024, Contesting Artificial Agents, In ACM Conference on Computer-Supported Cooperative Work and Social Computing, From Stem to Stern: Contestable AI Along AI Value Chains Workshop. <https://doi.org/10.48550/arXiv.2603.00066>
 - ✧ **Aijaz, A.**, Mutharaju, R., Kumar, M., Chattar, O. and Shukla, J., 2024, January. An Ontology to Capture Contextual Information to Facilitate Ethical Decision-making in AI Systems. In Proceedings of the 7th Joint International Conference on Data Science & Management of Data (11th ACM IKDD CODS and 29th COMAD). <https://doi.org/10.1145/3632410.3632493>
 - ✧ Kumar, M., **Aijaz, A.**, Chattar, O., Shukla, J. and Mutharaju, R., 2023. Opacity, transparency, and the ethics of affective computing. IEEE Transactions on Affective Computing, 15(1), pp.4-17. <https://doi.org/10.1109/TAFFC.2023.3278230>
 - ✧ Ahmad, M., **Aijaz, A.**, Ansari, S., Siddiqui, M.M. and Masood, S., 2018, April. Cryptanalysis of image cryptosystem using synchronized 4D lorenz stenflo hyperchaotic systems. In Information and Decision Sciences: Proceedings of the 6th International Conference on FICTA (pp. 367-376). Singapore: Springer Singapore. https://doi.org/10.1007/978-981-10-7563-6_38
 - ✧ **A. Aijaz**, R. Mutharaju, M. Kumar, AppIE: An Applied Ethics Ontology for Autonomous Moral Decision-making, 2025, Applied Ontology. <https://doi.org/10.48550/arXiv.2502.05110>
- **Others:**
 - ✧ **A. Aijaz**, R. Mutharaju, M. Kumar, Expected Moral Shortfall for Ethical Competence in Decision-making Models, 2026, (under review at ECML 2026). <https://doi.org/10.48550/arXiv.2602.13268>
 - ✧ R. Goel, A. Batra, **A. Aijaz**, R. Mutharaju, 2026, Case-based Reasoning for Ethical Theory Application.
 - ✧ **A. Aijaz**, R. Mutharaju, 2026, A Survey on Techniques to Discretize Ethical Decision-making.
 - ✧ S. Gulati, V. Aggarwal, R. Mutharaju, **A. Aijaz**, 2025, Value-Based Ontology Engineering (VBOE): A Methodology for Value Alignment in Ontology Development.

Relevant Projects

- ✧ I developed the **Applied Ethics Ontology (AppIE Onto)** ontology using a custom methodology which is inspired by the Simple Agile Methodology for Ontology Development (**Spiral+SAMOD**) and other associated standard practices. The development was modular and involves ethics theory and event context information. The ontology is also accompanied by Semantic Web Rule Language (SWRL) rules that can provide indicative rule-based determination of the morality of an action. [Project Link](#).
- ✧ I worked towards the development of a **Moral Decision Dataset (MDD)** which consolidates nearly 14k real-world cases where some ethical ambiguity is present. This dataset also includes additional features which adhere to the normative definition of ethics. YARRRML mappings were used to develop a context-rich semantically structured **Moral Decision Knowledge Graph (MDKG)**. The **Ethics Scoring Algorithm (ESA)** is a metric that facilitates the validation of the MDD and MDKG by providing a way to mathematically represent key features and provide explainable results for moral decision-making. ESA integrates ethical theory and contextual information to model moral decision-making with precision and adaptability. **Context-Sensitive Thresholding (CST)** was introduced to discretize moral grey areas. [Project Link](#).
- ✧ I extrapolated the financial concept of expected shortfall which minimizes high-risk situations to eventually avoid morally high-risk situations using hard constraints. This is the **Expected Moral Shortfall (EMS)**, which defines the risk measure of the morally worst off cases in a domain-specific set. A comparative analysis of techniques to instill ethical competence into AI models was presented, real-life application of EMS conveyed on two datasets, and a tradeoff of model metrics versus ethical competence deployed to recognize the true extent of practical social impact. [Project Link](#).

Awards and Recognition

- **Travel Grant Award**, IJCAI, 2025.
- **Selected Attendee with Travel Grant**, ACM Pingala Interactions in Computing, 2025.
- **Travel Grant Award**, AAAI/ACM AIES 2024.

- **Travel Grant Award**, IndoML, 2024.
- **Best Poster Award** for work titled “*Neurosymbolic AI for Applied Ethics*,” at Women in Data Science Conference (WiDS) in Association with Mastercard AI Garage, 2024.
- **Invited as Panel Member** at Heriot-Watt University Alumni Meet-up with the theme “*Navigating the Future: AI’s Impact on Workforce Dynamics, Career, and the Evolving Workplace*”, 2024.
- **Anveshan Setu Fellow**, ACM India, 2024.
- **Doctoral Consortium (PhD Clinic)**, ACM IKDD CODS-COMAD, 2023.
- **Travel Grant Award**, ACM IKDD CODS-COMAD, 2023.
- **Travel Grant Award**, Google Research Week, 2022.
- **Chanakya Fellow**, iHub Anubhuti, 2021-2024.

Research Service

- **Invited Reviewer** for Data and Knowledge Engineering Journal.
- **PC Member**: EKAW 2026, WWW 2026, K-CAP 2025, NeSy 2025, NeSy 2026, ACM WWW 2025
- **Reviewer**: AAAI 2026, AAAI 2025, NLP4HR/EACL 2024, ICON 2022
- **Sub-reviewer**: WWW 2024, NeSy 2024, CIKM 2023, BDA 2023

Technical Skills

- **Software Development**: Python, Java, R, C++, C, C#
- **Semantic Web**: Protege (Ontology/KG Development), SWRL rules, RDF Mapping, SPARQL, Apache Jena, Knowledge Representation (DL, FOL)
- **Database Management**: Advanced MS Excel, MySQL
- **Business Intelligence Software**: MS-Power BI
- **Quantitative Research**: SPSS, Smart PLS (SEM)

Certifications

- **Responsible AI Tour**, CODE IIT Madras
- **Understanding Research Methods**, University of London
- **Using IBM SPSS for Research**, Certified for IBM Business Analytics Software
- **Business Analytics Specialization**, Rice University
- **Data Analytics Training**, IIT Alumni Venture
- **Algorithmic Optimization, Scientific Computation, and their Applications in Science and Technology**, Jamia Millia Islamia
- **Advanced Content and Social Tactics to Optimize SEO**, University of California, Davis
- **Cyber Security and Ethical Hacking**, Bytecode Academy

Community Service and Memberships

- **Volunteer** at IEEE-Women in Engineering (IEEE-WIE)
- **Member**, Bahrain Statistical Society (BSS)
- **Member**, Computer Society of India (CSI-JMI Chapter)
- **Volunteer**, Association for Students in Economic and Commercial Sciences (AIESEC)
- **Editor-in-Chief**, Fiction Magazine, JMI CSE (2018).
- **Volunteer**, Black-belt trainer, Indo-International Taekwondo Academy, New Delhi.