JOYJIT CHATTERJEE

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Data Science & AI Researcher, Electronics and Communication Engineer (Gold Medallist), lifelong learner on the quest for knowledge. Seeking opportunity as a Data Scientist for real-world industrial applications.

EXECUTIVE SUMMARY

- Presently pursuing PhD. Computer Science in the domain of Artificial Intelligence (near completion) at the University of Hull, United Kingdom under a PhD. Scholarship by Aura Innovation Centre and University of Hull.
- Published an array of research papers in Computer Science & Engineering (including in leading AI conferences/workshops such as NeurIPS, KDD, IJCNN, ECAI etc., and reputed journals by Wiley, IOP etc.), filed patents and delivered talks at leading research institutions globally (such as Carnegie Mellon University, ETH Zurich etc.).
- Programme committee member and reviewer for leading international conferences/workshops (such as NeurIPS, ICLR Climate Change AI, ECIS, etc.), high-impact international journals (like Elsevier's Energy and AI), and authored books and articles in leading global venues.
- Recipient of several honors and awards throughout academic career, including grants, scholarships and awards from industry, academia and governments.
- Possess an excellent and an outstanding academic record throughout academic career.
- Research Interests span Deep Learning, Natural Language Processing and Generation, Knowledge Graphs, Causal Inference, Time-Series Analysis and Signal Processing, for the broader goal of Explainable AI.

ACADEMIC CREDENTIALS

PhD. Computer Science; 2018-2021 (Near Completion)
University of Hull, United Kingdom (Dependable Intelligent Systems/Big Data Analytics Research Group)
Research Project: Autonomous Prediction and Scheduling of Operations and Maintenance for Offshore Wind Farms (PhD. Scholarship Research Cluster as a part of Aura Innovation Centre and University of Hull)
Thesis Title: The Blessings of Explainable AI in Operations & Maintenance of Wind Turbines
PhD. Panel: Primary Supervisor - Dr. Nina Dethlefs (University of Hull), Co-Supervisor- Dr. Alex Turner (University of Nottingham), Chair - Prof. Yiannis Papadopoulos (University of Hull).

Post Graduate Diploma (PGDip.) in Research Training; September 2018 - January 2021
University of Hull, United Kingdom
Pursued 120 credits at Level 7 (Masters) offered by the Doctoral College as a part of the Postgraduate Training Scheme at the University of Hull designed to equip postgraduate researchers with the relevant skills and training to pursue cutting-edge research.

Bachelor of Technology (B.Tech) in Electronics and Communication Engineering; July 2014- June 2018
Amity University, Noida, India ***(University Topper & Gold Medallist)***
First Division with Distinction
CGPA: 9.68/10

Professional Development Courses

Oxford Artificial Intelligence Programme; August 2020
Saïd Business School, University of Oxford, United Kingdom
Professional Certificate in understanding AI, its potential for businesses, informed opinion of applications, implications and limitations to drive intelligent machines and AI forward in organizational contexts.
Final Grade: 85%

Summer School
Oxford Machine Learning Summer School (OxML); August 2020
Saïd Business School, University of Oxford, United Kingdom and Canadian Institute For Advanced Research (CIFAR)
Participated in the highly selective (Acceptance Rate ~ 11%) OxML Summer School, with a special focus on medicine and interactions with world-renowned researchers and lecturers in ML (and biomedicine). The school provided an unique opportunity to learn about past, present and future of ML research in healthcare (from EHR, imaging, and genetics to wearable, drug discovery and more).

WORK EXPERIENCE

PhD. Student-Researcher, University of Hull, United Kingdom (Sep 2018-Present)

- Applied Deep Learning techniques to real-world data from wind turbine sensors (SCADA) and alarm records towards developing explainable decision support system for engineers & technicians to support operations and maintenance (O&M) in the offshore wind industry.
- Research focussed on optimising O&M through automated data-driven decision making during condition-based monitoring (CBM), for reducing O&M costs and making wind turbines more reliable.
- Closely collaborated with leading wind farm operators and research organisations such as ORE Catapult, UK.
- Leveraged Explainable AI techniques such as Natural Language Generation, Temporal Causal Inference and Knowledge Graphs for Explainable Anomaly Prediction, O&M Planning and Generation of Human-Intelligence Decision Support Reports for bridging the gap between accuracy and transparency in conventional black-box machine learning models.
- Worked as a part of the Aura Wind Energy PhD. Cluster (https://aurawindenergy.com) and Dependable Intelligent Systems/Big Data Analytics Research Group at the University.

Technology Intern, Bright Network, London, United Kingdom (July-Aug 2020)

- Pursued Internship in the Technology Segment as a part of Internship Experience UK programme organised by the Bright Network.
- Focused on industry best practices in Agile Software Development, Communications, Product Development Planning and Management alongside Testing and Deployment for incorporating Facial Verification technology into existing banking apps.

Research Intern, **Tamkang University, Taipei, Taiwan** (Jan-March 2018)

- Worked in the area of machine learning, pattern recognition and signal processing on a project funded by the Ministry of Education, Taiwan as a part of TEEP@India research program.
- Designed a software application for recognizing emotions in human speech signals, by applying data analytics and signal processing techniques.

System Verilog Trainee, Mentor Graphics (A Siemens Business), Noida, India (May-July 2017)

- Selected for the highly prestigious internship opportunity among 30 students from across India as a part of Mentor Higher Education Program on Verification of Electronic Design and Systems using System Verilog.
- Used Verilog for Electronic Systems Design in various projects, including Universal Asynchronous Receiver Transmitter, 8-bit and 16-bit RISC Microprocessor, First-In-First-Out (FIFO) buffer etc.

SELECTED PUBLICATIONS

JOURNAL ARTICLES

- **Chatterjee, J.,** Dethlefs, N., "XAI4Wind: A Multimodal Knowledge Graph Database for Explainable Decision Support in Operations & Maintenance of Wind Turbines", Energy Reports, Elsevier. **Impact Factor: 3.595** (Under Review). arXiv Preprint https://arxiv.org/abs/2012.10489
- **Chatterjee, J.,** Dethlefs, N., "Scientometric Review of Artificial Intelligence for Operations & Maintenance of Wind Turbines: The Past, Present and Future", Renewable and Sustainable Energy Reviews, Elsevier. **Impact Factor: 12.110** (In Revision)
- **Chatterjee, J.,** Dethlefs, N., "Temporal Causal Inference in Wind Turbine SCADA Data Using Deep Learning for Explainable AI", IOP Journal of Physics: Conf. Series, September 2020.
- **Chatterjee, J.,** Dethlefs, N. Deep learning with knowledge transfer for explainable anomaly prediction in wind turbines. Wind Energy, Wiley, April 2020; 23: 1693– 1710. **Impact Factor: 3.125**

CONFERENCE/WORKSHOP PAPERS
(*Talk Delivered , ^Poster Presented)

- **Chatterjee, J.,** "Data-Driven Explainable Decision Support for Operations & Maintenance of Wind Turbines", (Working Paper)
- **Chatterjee, J.,** Dethlefs, N., "Deep Reinforcement Learning for Maintenance Planning of Offshore Vessel Transfer", 4th International Conference on Renewable Energies Offshore (RENEW), Lisbon, Portugal, October 2020.* (Published as a book chapter in Developments in Renewable Energies Offshore, CRC Press, Taylor & Francis).

- **Chatterjee, J.,** "Explainable AI for Intelligent Decision Support in Operations & Maintenance of Wind Turbines", Proceedings of the European Conference on Artificial Intelligence (ECAI)'s Doctoral Consortium, Santiago, Spain, August 2020.* **CORE RANKING: A**
- **Chatterjee, J.,** Dethlefs, N., "The Promise of Causal Reasoning in Reliable Decision Support for Wind Turbines", 26th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) at Fragile Earth: Data Science for a Sustainable Planet Workshop (FEED Workshop, San Diego, California, USA, August 2020.* **CORE RANKING: A***
- **Chatterjee, J.,** Dethlefs, N., "A Dual Transformer Model for Intelligent Decision Support for Maintenance of Wind Turbines", IEEE International Joint Conference on Neural Networks (IJCNN), Glasgow, UK, July 2020.* **CORE RANKING: A and part of WCCI (World's Largest Technical Event in Computational Intelligence)**
- **Chatterjee, J.,** Dethlefs, N., "Natural Language Generation for Operations and Maintenance in Wind Turbines", 33rd International Conference on Neural Information Processing Systems (NeurIPS) at Tackling Climate Change with Machine Learning Workshop, Vancouver, Canada, December 2019.^ **CORE RANKING: A***
- **Chatterjee, J.,** Dethlefs, N., "Transparent Deep Learning and Transductive Transfer Learning: A New Dimension for Wind Energy Research", WindEurope Offshore 2019, Copenhagen, Denmark, November 2019.^ **Largest Offshore Wind Conference in Europe**
- **Chatterjee, J.** and Dethlefs, N., "A Deep Learning Approach Towards Prediction of Faults in Wind Turbines", Extended Abstract in Northern Lights Deep Learning Workshop (NLDL), Tromso, Norway, January 2019.*
- **Chatterjee, J.**, Mukesh, V., Hsu, HH., Vyas, G., and Liu, Z., "Speech Emotion Recognition Using Cross-Correlation and Acoustic Features", 3rd IEEE Cyber Science and Technology Congress, Athens, Greece, August 2018.
- **Chatterjee, J.**, Saxena, A., Vyas, G., and Hsu, HH. "A Novel Approach towards identification of in-flight situation based on Air Traffic Control Conversations", 4th IEEE International Conference on Signal Processing and Integrated Networks (SPIN), Noida, India, February 2017.*
- Chaabra, P., Vyas, G., **Chatterjee, J.** and Voss, SH., "An Automatic system for recognition and assessment of anger using Adaptive Boost", IEEE International Conference on Microelectronics and Telecommunication Engineering (ICMETE), Ghaziabad, India, September 2016.*

ABSTRACTS

- **Chatterjee, J.** and Dethlefs, N., "Transparency, Interpretability and Data Availability: Key Challenges for Tackling Climate Change with AI", Workshop on Data Science in Climate and Climate Impact Research, ETH Zurich, Switzerland, August 2020.*

PATENTS

- Thakur, A., Aggarwal, P. and **Chatterjee, J.** (2018), "Automatic cooling system-based rabbit hutch", Complete specifications filed with the Indian Patent Office (Application Number 201811028105).
- **Chatterjee, J.** and Thakur, A. (2018), "An intelligent emergency trigger bracelet for alcohol and drug induced people", Complete specifications filed with the Indian Patent Office (Application Number 201811002051).
- **Chatterjee, J.** (2017), "User friendly HelPen for assisting visually challenged", Complete specifications filed with the Indian Patent Office (Application Number 201711011221).

TALKS / PRESENTATIONS DELIVERED

- Delivered a talk on "Transparency, Interpretability and Data Availability: Key Challenges for Tackling Climate Change with AI" at the ETH Zurich, Switzerland Workshop on Data Science in Climate and Climate Impact Research in August 2020.
- Delivered a talk on "Transparent, Accurate and Scalable AI for Intelligent Decision Support in O&M of Wind Turbines" at the Carnegie Mellon University (CMU) Symposium on AI and Social Good, Pittsburgh, Pennsylvania in April 2020. **(Prestigious Symposium on addressing challenging societal problems through AI)**
- Delivered a talk on "Autonomous Prediction and Scheduling of Operations & Maintenance for Offshore Wind Farms" at the Postgraduate Research Seminar, Dept. of Computer Science & Technology, University of Hull, UK in February 2020.

TECHNICAL SKILLS

- **Programming:** Python (Proficient), MATLAB (Proficient), C and C++ (Intermediate), R (Basic), Java SE/Core Java (Basic), Octave (Basic), Assembly Language for 8051 Microcontroller and x86 Processors (Proficient).
- **Data Science & AI Frameworks in Python:** TensorFlow (Proficient), Keras (Proficient), PyTorch (Basic), Scikit-learn (Proficient), Pandas (Proficient), Matplotlib (Proficient), Seaborn (Intermediate), Numpy (Intermediate).
- **Artificial Intelligence Domain Knowledge:** Machine Learning and Deep Learning (Proficient), Regression and Classification algorithms (Proficient), Natural Language Processing (Intermediate), Natural Language generation (Proficient), Neural Machine Translation (Intermediate), Transfer Learning (Proficient), Few Shot Learning (Basic),

Data-to-text generation (Intermediate), Supervised Machine Learning (Proficient), Unsupervised Machine Learning (Basic), Causal Inference (Proficient).

- **Machine Learning Models & Techniques:** Decision Trees (Proficient), Random Forests (Proficient), Linear and Logistic Regression (Proficient), Naïve Bayes Classifier (Intermediate), Gradient Boosted Learners like XGBoost (Proficient), Support Vector Machine (Proficient), k-Nearest Neighbors (Intermediate), Autoencoders (Basic).
- **Deep Learning Models & Techniques:** Artificial Neural Networks (Proficient), Recurrent Neural Networks (Proficient), Convolutional Neural Networks (Intermediate), Attention-based learners (Proficient), Sequence to Sequence Models (Proficient), Transformers (Proficient), Dilated networks (Intermediate), Graph Neural Networks (Basic), Large-Scale Language Models like GPT-2, BERT etc. (Intermediate).
- **Data Analytics:** Information Extraction (Proficient), Knowledge Representation (Proficient), Knowledge Engineering (Proficient).
- **Data Preprocessing:** Oversampling Techniques like SMOTE (Proficient), Encoding Techniques (Proficient), Imputation Techniques (Proficient), Outlier Detection Algorithms (Intermediate), Feature Scaling and Normalisation (Proficient).
- **Natural Language Understanding and Analytics:** Paraphrase Generation (Proficient), Text Summarisation (Intermediate), Named Entity Recognition (Basic), Semantic Labelling (Intermediate), Topic Identification (Intermediate), Clustering (Basic), Topic Modelling (Proficient).
- **Knowledge Graphs and Ontology:** Graph Database Development in Neo4j (Proficient), Graph Query Language – Cypher (Proficient), Graph Data Analytics (Intermediate).
- **AI Good Practices:** Bias Mitigation (Proficient), Fairness and Accountability (Proficient), Explainable AI (Proficient), Privacy and Security (Intermediate), Reliability and Safety (Intermediate).
- **Software Engineering Practices:** Handling Large-Scale Software Projects (Proficient), Design (Proficient), Implementation (Proficient), Testing (Intermediate).
- **Cloud Computing:** Amazon Web Services (Basic).
- **Documentation Languages/Platforms:** LaTex (Proficient).
- **Web Development:** HTML and CSS (Intermediate), JavaScript (Basic).
- **Application Development and Deployment:** High Performance Computing (Intermediate), Docker (Basic).
- **Networking:** CISCO Packet Tracer (Basic).
- **Electronic Design and Automation/Verification:** VHDL (Proficient), Verilog and System Verilog (Proficient)
- **Operating Systems:** Windows (Proficient), MacOS (Proficient), Linux OS (Intermediate).
- **Electronic Design and Simulation:** LabView (Proficient), Orcad (Proficient).
- **Control and Automation:** Control Systems and Digital Electronics.
- **Office Suite:** MS Office (Proficient), iWork MacOS Suite (Proficient).

SELECTED CERTIFICATIONS

- Certificate in Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning from deeplearning.ai through Coursera in February 2021.
- Passed LinkedIn Skill Assessments and received skill badges for Python, Machine Learning, HTML, Microsoft Word.
- Certificate in Docker for Data Scientists from LinkedIn Learning in July 2020.
- Certificate in Introduction to Neo4j from Neo4j GraphAcademy in May 2020.
- Certificate in The Digital Teacher from University of Hull, UK in May 2020.
- Certified Peer Reviewer from Publons Academy (Web of Science) in February 2020.
- Certificate in The Digital Researcher from University of Hull, UK in June 2019.
- Certificate in Jisc discovery tool from Jisc in June 2019.
- Certificate in Passport to University Teaching from University of Hull, UK in March 2019.
- Certificate in Open Researcher from the University of Hull, UK in October 2018.
- Certificate in MATLAB Onramp from MathWorks in September 2018.
- Certificate in Programming Foundations with JavaScript, HTML and CSS (with Honors) from Duke University, USA through Coursera in March 2018.
- Certificate in Learning MATLAB from LinkedIn Learning in February 2018.
- Certificate in Programming for Everybody (Getting Started with Python) from University of Michigan, USA through Coursera in August 2017.
- Certificate in Verification of Electronic Design and Systems using Systems Verilog from Mentor Graphics (A Siemens Business) in July 2017.
- Ericsson Professional Certification (EXCEL) in IP and Telecom Basics during Career Connect Program held at Amity University, Noida, India in February 2017
- Certificate in Begin Robotics from the University of Reading, U.K. through Future Learn in February 2017.
- Certificate in C++:A General Purpose Language and Library Jump Start from Microsoft Virtual Academy in October 2016.
- Certificate in C# Fundamentals for Absolute Beginners from Microsoft Virtual Academy in June 2016.

- Certificate in Introduction to Project Management from University of Adelaide, Australia through edX in April 2016.
- Certificate in Introduction to Python for Data Science from Microsoft Corporation through edX in March 2016.
- Certificate in Lean Six Sigma Yellow Belt from Canopus Business Management Group- (International Association for Six Sigma Certification and Council For Six Sigma Certification Accredited) in December 2015.
- Certificate in Introduction to Cloud Computing from Advanced Learning Interactive Systems Online (ALISON) in 2015.
- Certificate in IT for Business Success from HP in 2015.
- Certificate in Customer Relationship Management from HP in December 2015.

PROGRAM COMMITTEE MEMBERSHIPS/REVIEWER COMMITTEES SERVED

- Reviewer for the 15th International Conference on Energy Sustainability of The American Society of Mechanical Engineers (ASME ES 2021).
- Reviewer for the Energy and AI Journal, Elsevier.
- Program Committee Member and Reviewer for the "Tackling Climate Change with Machine Learning" workshop at the International Conference on Neural Information Processing Systems (NeurIPS 2020). **CORE RANKING: A***
- Reviewer for the Annals of Biomedical Engineering Journal, Springer Nature- Official Journal of the Biomedical Engineering Society (Impact Factor: 3.607).
- Reviewer for the PeerJ Computer Science Journal (Impact Factor: 2.34).
- Program Committee Member and Reviewer for the "Tackling Climate Change with Machine Learning" workshop at the International Conference on Learning Representations (ICLR 2020). **CORE RANKING: A***
- Conference Paper Reviewer for the 31st European Conference on Information Systems (ECIS 2019) organized by Stockholm University, Sweden.

PROFESSIONAL MEMBERSHIPS

- **Member:** IET UK (MIET), IEEE USA (MIEEE), Machine Intelligence Labs (USA), Chartered Engineer (CEng) and Associate Member (AMIE), Institution of Engineers (India)..
- Executive Committee Member of the Multimedia Communications Technical Professional Network of IET UK from 2016-2019.
- **Junior Member**: Isaac Newton Institute for Mathematical Sciences, Cambridge, UK.
- **Student Member:** United Nations Association (UNA)-United Kingdom, The British Computer Society, The Society for the Study of Artificial Intelligence and Simulation of Behavior (AISB), UK.
- Life Member, Indian Science Congress Association, Govt. of India.

EXTRAMURAL ENGAGEMENTS

- Student Organizer of 5th International Conference on Signal Processing and Integrated Networks (SPIN 2018) held in February 2018.
- Regular contributor to Medium blogs and Towards Data Science (http://joyjitece.medium.com) in the area of Machine Learning/Deep Learning with highly viewed and applauded articles in this domain.
- Contributor at The Good AI (http://thegoodai.co), the first one-stop online media organisation (based in France with a global outreach) providing a one-stop platform towards using AI responsibly within companies, governments and public sectors.
- Author of the Book "Thoughts of A Young Man"- A Collection of Short Poems, Random Thoughts and Inspirational Quotes published by Educreation Publishing, Delhi, India in September 2017.
- Campus Ambassador for the Entrepreneurship Cell, Indian Institute of Technology (IIT) Kanpur, India from 2017-2018.
- Volunteered in various Social and Human Values Events organized at Amity University, Noida, India from 2014-2018.

SCHOLARSHIPS AND FUNDS AWARDED

- Awarded full funding (PhD. presenter award) from AI for Good Foundation at the ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)'s Fragile Earth: Data Science for a Sustainable Planet Workshop (FEED Workshop, San Diego, California, USA in August 2020.
- Awarded a scholarship of 4,500 Euros for participation in the Nudge Global Impact Challenge 2020 an 8-month online personality development programme by Nudge Netherlands and its partner sponsors.
- Awarded early career researcher partial grant towards registration for the International Joint Conference on Neural Networks (IJCNN), July 2020, Glasgow, UK by IEEE Computational Intelligence Society.
- Awarded travel grant of 1,000 USD sponsored by Microsoft Research and Deep Mind for presenting research at the "Tackling Climate Change with Machine Learning" workshop at 33rd International Conference on Neural Information Processing Systems (NeurIPS 2019) in Vancouver, Canada.

- Funding of 150 GBP from Aura Innovation Centre, UK to present research at WindEurope Offshore, Denmark in November 2018.
- Funding from University of Hull, UK of 400 GBP to participate in Power Available Hackathon organized by ORE Catapult and Scottish Power Renewables in Glasgow, UK.
- Funding from University of Hull, UK of 1,300 GBP to present research at Northern Lights Deep Learning Workshop (NLDL), Norway in January 2019.
- Fully funded PhD. Scholarship totaling 48,000 GBP in Computer Science at University of Hull, United Kingdom (2018-2021) for the project "Autonomous Prediction and Scheduling of Operations and Maintenance for Offshore Wind Farms", directly after undergrad in 2018.
- Awarded scholarship of 1,800 USD by Ministry of Education, Taiwan for pursuing Research at Tamkang University, Taiwan as a part of the TEEP@India Program from January-April 2018.
- Studied B. Tech Electronics and Communication Engineering on Merit Scholarship (6000 GBP) for the entire duration of course at Amity University, Noida, India.

ACCOLADES

- Selected and invited to the ASML Europe PhD. Master Class 2020 (amongst approx. 70 final year PhDs. From European Universities to be selected) after a competitive selection process.
- Received the Hull Employability Award for Postgraduate Researchers from the University of Hull, UK as an endorsement of excellent employability skills in May 2019.
- Won the competition PGR Postgraduate Research Experience Survey (PRES) challenge organized by the Graduate School, University of Hull, UK in May 2019.
- Honored with the Young Researcher Award by IEEE UK & Ireland Section in April 2019.
- Awarded Shri Baljit Shastri Award for Best in Human and Traditional Values, the most coveted award of Amity University during Concluding Ceremony in May 2018.
- Awarded for Best Summer Training at Amity University during Concluding Ceremony in May 2018.
- Awarded First Prize in the Annual Projects and Posters Technical Competition (APPTeC) at Amity University, Noida, India for research work titled "An Automated System For Predicting Lung Disorders using Tracheal Breath Count and Statistical Features" in March 2018.
- Awarded for organization and outstanding contribution for the grand success of 5th International Conference on Signal Processing and Integrated Networks (SPIN 2018) held in February 2018.
- Received Letter of Appreciation from College of Engineering, Tamkang University, Taiwan for doing outstanding Research work at TKU during January-March 2018.

REFERENCES: Available on Request