

Djordje Batic

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AI Research Engineer with 5+ years of experience in designing AI systems in energy applications. My work focuses on **(edge) AI training and evaluation**, with emphasis on diagnosing model failures, applying techniques such as knowledge distillation and attribution-based regularization to improve model behaviour **(AI Model Compression)**, designing automated evaluation frameworks to assess model performance and reliability across diverse scenarios and edge cases **(Data & Model Evaluation)**, incorporating domain knowledge into development workflows and designing interpretable training objectives to enhance model performance and reliability for real-world deployment **(Interpretability & Deployment)**.

Education

- **Ph.D. in Electronic & Electrical Engineering - University of Strathclyde** Glasgow, UK
Focus: Trustworthy AI at the Intersection of AI and Energy Research | Marie Curie Fellow Oct 2021 - May 2025
- **M.Sc. in Electrical & Computer Engineering - University of Novi Sad** Novi Sad, Serbia
Focus: Computer Science, ML, Robotics, Control Systems, Automation | CGPA: 9.50/10.00 Sep 2016 - Sep 2021

Work Experience

- **University of Strathclyde** Glasgow, UK
Marie Curie Early Stage Researcher (2021-2025) and Postdoctoral Researcher (2025-) Oct 2021 – Aug 2025
 - **Explainable Knowledge Distillation for Edge AI Deployment [1], [4]:**
 - * Developed a novel knowledge distillation regularization technique to improve the knowledge transfer of models used in edge deployment of energy disaggregation systems, enhancing interpretability and achieving up to 22.6% predictive performance improvement while maintaining low computational overhead.
 - **Evaluating and Improving Reliability and Robustness of AI Systems [2], [3]:**
 - * Proposed a novel framework for evaluating the trustworthiness of (X)AI systems used in energy disaggregation, developing metrics for robustness, faithfulness, and sparsity. Built a comprehensive benchmark suite for quantitative assessment of interpretability methods in this domain.
 - * Developed a novel model-agnostic AI training framework that utilizes attribution priors to enhance training of interpretable models for energy disaggregation, jointly improving interpretability metrics and predictive performance across diverse set of architectures.
 - **Graph Neural Networks (GNNs) for Spatio-Temporal Systems [5], [6]:**
 - * Applied GNNs to the problem of optimal EV charging infrastructure placement, combining graph embeddings with a model-agnostic greedy search algorithm for efficient and scalable planning, achieving up to 55% improvement in charging utilization simulations.
 - **Large-Scale Datasets [7]:**
 - * Created and open-sourced GridCharge dataset, capturing over 5 million public EV charging sessions in Scotland with high-granularity data including carbon intensity, occupancy, energy consumption, and weather. Leveraged LLMs to automatically parse, structure, and standardize thousands of diverse and unstructured tariff data documents. | [Github](#) | [HuggingFace](#)
 - **Consultancy:**
 - * **PictureIT:** Developed a speech-to-image framework and an educational app that enables generation of custom AAC-style images for use in education of neurodivergent children, securing two rounds of government funding. Implemented end-to-end by fine-tuning a lightweight adapter over a diffusion-based generative model for multi-modal image generation, running with on-device inference.
 - * **Hugo Energy:** Led development of an automated pipeline for energy profiling using historical smart meter data collected from 50,000+ customers across UK, in partnership with University of Oxford and University of East Anglia. Communicated insights and proposed a methodology for identification of seasonal electricity consumption flexibility, creating behavioral customer segments for targeted demand-response programs.
 - * **Flock Energy:** Developed a core pipeline for training of energy disaggregation algorithms with contextual data used to deliver detailed energy usage insights to customers in Asian markets. | [Github](#)
- **BioSense Institute** Novi Sad, Serbia
Research Assistant Jan 2021 – Oct 2021
 - Developed a multi-task learning approach for joint boundary delineation and instance segmentation of agricultural parcels from satellite imagery. Findings led to adoption of new multi-task pipeline to replace existing single-task baselines for crop monitoring.
- **Cinteraction** Aug 2020 – Nov 2020
AI Development Consultant
 - Designed and optimized a CNN model for real-time facial affect analysis, leveraging CUDA inference optimization using double-buffering. Deployed on mobile devices, achieving 57% improvement in throughput. | [Github](#)

SKILLS

- Python, Pytorch, TensorFlow, C/C++, Java, JavaScript, SQL, Git, Docker, Slurm, AWS, L^AT_EX

AWARDS AND FUNDING

- **2021:** Marie Curie Doctoral Fellowship (~€125,000) - EU Horizon 2020 MSCA-ITN Program
- **2023-2025:** Secured over £20k from consultancy projects, contributed to additional ~£200k funding from proposals.

LANGUAGES

- English (Fluent), Serbo-Croatian (Native), German (Basic)

SELECTED PUBLICATIONS

- [1] **Batic, D.**, Tanoni, G., Stankovic, L., Stankovic, V., Principi, E., “[Improving Knowledge Distillation for Non-Intrusive Load Monitoring through Explainability Guided Learning](#)”, *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2023.
- [2] **Batic, D.**, Stankovic, V., Stankovic, L., “[XNILMBoost: Explainability-informed Load Disaggregation Training Enhancement using Attribution Priors](#)”, *Engineering Applications of Artificial Intelligence*, 2024.
- [3] **Batic, D.**, Stankovic, V., Stankovic, L., “[Towards Trustworthy Load Disaggregation – A Framework for Quantitative Evaluation of Explainability using Explainable AI](#)”, *IEEE Transactions on Consumer Electronics*, 2023.
- [4] **Batic, D.**, Tanoni, G., Principi, E., Stankovic, L., Stankovic, V., Squartini, S., “[Interpretability and Reliability-driven Knowledge Distillation for Non-intrusive Load Monitoring on the Edge](#)”, *Expert Systems with Applications*, 2025.
- [5] **Batic, D.**, Stankovic, V., Stankovic, L., “[Geodemographic Aware Electric Vehicle Charging Location Planning for Equitable Placement Using Graph Neural Networks: Case Study of Scotland Metropolitan Areas](#)”, *Energy*, 2025.
- [6] **Batic, D.**, Stankovic, V., Stankovic, L., “[ChargeDEM: Geodemographic Aware EV Charging Infrastructure Placement for Enhanced Site Selection using Graph Neural Networks](#)”, *International Conference on Energy Efficiency in Domestic Appliances and Lighting (EEDAL)*, 2024.
- [7] **Batic, D.**, “[GridCharge: Capturing Carbon Intensity of 5M+ Public EV Charging Sessions in Scotland](#)”, 2025.
- [8] **Batic, D.**, Stankovic, L., Stankovic, V., “[Analysis of Smart Meter Data for Energy Waste Management](#)”, *Artificial Intelligence for Sustainability: Innovations in Business and Financial Services*, 2024.
- [9] **Batic, D.**, “[Towards Trustworthy AI Systems for Smart Grid Management: Facilitating Robustness, Transparency and Fairness in the Energy Transition](#)”, *PhD Thesis*, University of Strathclyde, 2025.
- [10] Ilic, V., **Batic, D.**, Mirkovic, M., Vukmirovic S., Culibrk, D., Bosakov, G., “[Automatic Emotion Detection as a Teaching Aid in Online Knowledge Assessment](#)”, *2021 20th International Symposium INFOTEH*, 2021.
- [11] **Batic, D.**, Culibrk, D., “[Identifying Individual Dogs in Social Media Images](#)”, *2019 British Machine Vision Conference (BMVC) Workshop on Visual AI and Entrepreneurship (VAIE)*, 2019.