Jed Guzelkabaagac

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Education

Technical University of Munich, M.Sc. Mathematics in Data Science — Oct 2023 — Present
- **GPA 1.2**, top 2% of cohort.
- relAI scholarship for 2023–25 (€12k/year); Deutschlandstipendium (€4k/year) 2023/24 (declined).

University of Bath, B.Sc. & M.Sc. Mathematics — Oct 2016 — Jul 2020
- **GPA 1.0**, converted by uni-assist.

Publications

Schuchardt, J.; Dalirrooyfard, M.; **Guzelkabaagac, J.; et al.** — **ICML 2025**

Privacy amplification by structured subsampling for deep differentially private time-series forecasting (PDF)
- Selected as a Spotlight Paper at ICML 2025 (top 2.6% of accepted submissions)

Research & Projects

Multi-Objective Generation in Drug Design, Research Intern, University of Alberta — Aug 2025 — Current
- Implementing Pareto-guided diffusion to steer generation towards desirable properties, while preserving sample fidelity.
- Integrating multi-objective Bayesian optimization to nominate batches of candidates and close the generator–oracle loop.
- Benchmarking against scalarization and MCTS-based ParetoDrug, reporting hypervolume to quantify front quality and diversity.

Self-Supervised Learning for Robot Grasping, Learning AI for Dextrous Robots Chair — May 2025 — August 2025
- Investigating self-supervised learning for robot grasping as part of TUM's Advanced Deep Learning for Robotics course.
- Leveraging Point-JEPA's joint-embedding predictive architecture to learn spatially sequenced point-cloud features, capturing local geometry and global context to reduce novel-object grasp failures.
- Improved top-logit RMSE by 26% across low to mid data regimes, improved Coverage@15°. Aiming for a workshop submission.

Differential Privacy for Time-Series Forecasting, Data Analytics and Machine Learning Chair — Oct 2024 — Jun 2025
- Derived tight event- and user-level privacy bounds for DP-SGD with structured subsampling of time-series subsequences.
- Engineered novel techniques to tighten upper bounds of Gaussian and Laplace noise mixtures under hockey-stick and Rényi divergences, unlocking stronger privacy guarantees.

Deep Learning for RNA Drug Discovery, Helmholtz Institute of Computational Biology — Oct 2024 — Apr 2024
- Applying deep learning to predict RNA–ligand binding affinities from sequence data, in collaboration with TUM DI Lab.
- Benchmarked graph (GCN, GIN, GDC) and sequence-based (1D-CNN, RNA-FM) encoders against the RSAPred linear baseline, demonstrating consistent RMSE improvements across both interpolation and extrapolation splits.
- Integrated pre-trained RNA-FM embeddings, employed LoRA fine-tuning, and explored cross-attention pretraining on a self-curated pocket-interaction dataset to mitigate data scarcity and better capture nucleotide–ligand interactions.

Zero-Shot 3D Shape Correspondence, Visual Computing & AI Chair — Apr 2024 — Jul 2024
- Conceived and implemented GeoAware3D as part of TUM's Advanced Deep Learning for Computer Vision course.
- Engineered a pipeline fusing per-pixel standard diffusion and DINO features into 3D point descriptors via multi-view rendering and projective analysis, requiring no additional training or labels.
- Achieved comparably accuracy to SOTA on SHREC'19 semantic correspondence, requiring 4x less time at inference.

Work Experience

Data Science Graduate, Lloyds Banking Group — London, United Kingdom — Sep 2022 — Apr 2023
- Built an emissions-estimation model for enterprise clients using gradient-boosted regression, increasing accuracy by 15%.
- Addressed sparse SME data via synthetic augmentation and tuned regional factors for UK-wide relevance.

Analytics Consultant, Hyper Group — Leeds, United Kingdom — Sep 2021 — Jul 2022
- Engineered ETL pipelines from AWS to Snowflake, increasing throughput by 25%, enhanced the database with triggers/views.
- Created executive dashboards in Cloud SQL, defining KPIs on price elasticity and customer retention.

Awards & Extracurriculars

Full Scholarship · Konrad Zuse School of Excellence in Reliable AI (relAI) — Sep 2023 — Sep 2025

Research Stipdend · University of Alberta Research Experience (UARE) — Aug 2023 — Oct 2025