

IRTAZA KHALID

khalidmi@cardiff.ac.uk ♦ erg0dic.github.io

EDUCATION

Cardiff University, UK

Oct 2020 - Aug 2023

PhD, Computer Science [Full Scholarship]

Thesis: *Machine learning methods for robust quantum optimal control*

Supervisors: Prof EA. Jonckheere (USC), CA. Weidner (QET labs), SG. Schirmer, FC. Langbein (Cardiff)

Imperial College London, UK

Oct 2016 - Jul 2020

MSci, Physics, 1st Class Honours

MSci project on *Optimizing noisy quantum process tomography* [Family funded. Mom is an OB/Gyn Specialist at Al Qunfudah General Hospital and Dad is an emergency medicine specialist at Al Rawaidah General Hospital]

SELECTED PUBLICATIONS; GOOGLE SCHOLAR:

- Sample efficient Model-based Reinforcement Learning for Quantum Control
Phys. Rev. Research 5 (4), 043002. 2023
I. Khalid, CA Weidner, EA Jonckheere, SG Schirmer, FC Langbein
- Statistically Characterising Robustness and Fidelity of Quantum Controls and Quantum Control Algorithms
Phys. Rev. A 107, 032606. 2023
I. Khalid, CA Weidner, EA Jonckheere, SG Schirmer, FC Langbein
- Systematic Relational Reasoning With Epistemic Graph Neural Networks
ICLR 2025 main conference
I. Khalid, S. Schockaert
- Large Language and Reasoning Models are Shallow Disjunctive Reasoners
ACL 2025 main conference
I. Khalid, Amir Masoud Nourollah, S. Schockaert
- When No Paths Lead to Rome: Benchmarking Systematic Neural Relational Reasoning
NeurIPS 2025 main conference (D&B)
A. Das*, **I. Khalid***, Rafael Pealoza, S. Schockaert

EXPERIENCE

Gray Scrubs AI

Co-founder and CTO (part-time)

Feb 2025 -

Run a pre-seed health tech startup, full-stack, with 4 employees, focused on automating medical workflows. Currently implementing pilot programs at proof-of-concept validation stage in partnership with hospitals and clinical centers in Pakistan, United States, United Kingdom and Saudi Arabia.

Our solution stack comprises of:

- Arabic to EHR structured note taking scribe using an efficient low latency NLP pipeline that reduces medical note taking time by over 80%.
- Voice agents for HEDIS, Geriatric routine check-ins, Appointment scheduling via Mobile APIs that cut down no-show rates by over 50%. We developed an in-house no-show risk scoring model and scheduling algorithm with a recall of rate of 85%.
- NPO violation detection and surgical compliance (e.g. CLABSCI) routine automation using classical on-edge (HIPPA complaint by definition) vision ML models that aim to reduce surgical cancellations by over 80%.

Cardiff University

Cardiff, UK

Machine Learning Engineer / Postdoctoral Research Fellow in Computer Science

Sep 2023 -

Project ReSTorE: EP/W003309/1 (EPSRC grant)

Reasoning about structured story representations. Creating story graphs from raw text documents (e.g. newspaper articles) and then applying reasoning models to "read between the lines" and do document level information retrieval.

Working on making LLMs and LLM modulo AI (e.g. GNNs) systematically reason i.e. compositionally generalize OOD in sparse data regimes. Creating hybrid reasoning engines using LLM-generated knowledge graphs and graph denoised encoders (Edge transformers).

Leadership Experience:

- Co-advisor to Amir Masoud Nourollah (2024-) PhD student working on machine learning inter-atomic potentials
- Leading postdocs Anirban Das (2025-), John Fabila-Carraso (2025-) with on-boarding, coding, research on ReSToRE

Royal Bank of Canada

Quantitative Research Intern

London, UK

Jun 2019 - Aug 2019

On the Global Markets trading floor. Worked on market impact forecasting in algorithmic equities and portfolio optimization in electronic foreign exchange (eFX).