HENRY GROVES

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Education

Newcastle University **2023–2027**

- **M.Sc. + B.Sc. (Hons) Computer Science**
- **B.Sc. dissertation:** *Quantum-Inspired Models of Emotional Memory*, mark 81 (First). Supervised by Dr. J.R. Hance; developed into a co-authored preprint

Pontefract New College **2021–2023**

- **A Levels:** Mathematics (**A***), Further Mathematics (**A**), Computer Science (**A**), Physics (**A**)
- **EPQ:** "To what extent will quantum computing replace high performance computing in computational biology?" (**A**)

Publications & Presentations

- **Groves, H.**, Jackson, L.F., Robertson, B.-A., and Hance, J.R. *Modelling Emotional Memory in Children with Tensor Networks.* Preprint, arXiv:2606.28470, 2026.
- Robertson, B.-A.*, Jackson, L., **Groves, H.**, and Hance, J.R. *Emotional Modulation of Temporal Order Memory in Childhood: A Quantum-Informed Account.* Oral presentation, QIP26, Växjö, Sweden, June 2026. *presenter

Research Experience

B.Sc. Dissertation, Quantum Group, Newcastle University **2025–2026**

- Built quantum-inspired matrix product state (MPS) models of children's temporal order memory, encoding emotional valence and recall outcome as a joint composite-site index.
- Compared binary (qubit), three-state (qutrit) and valence-primed models with classical baselines (Naive Bayes, Markov chain) under 5-fold cross-validation; the valence-primed model reached 77.98% accuracy.
- Implemented in Julia with ITensors.jl; extended into a co-authored preprint and a QIP26 conference talk.

Industry Experience

Northern Powergrid — *Returning Summer Internship*

Data Scientist (DSO) **June–September 2026**

- Designed a shared development framework for the data science team, built on Reproducible Analytical Pipeline (RAP) principles, with standardised logging, configuration management and CI/CD.
- Migrated 2 legacy manual Power BI/Excel processes to RAP pipelines, cutting run time from several days to a few minutes.

Data Scientist (DSO) **May–September 2025**

- Developed a bottom-up, graph-based simulation of high-voltage networks under normal and fault conditions from historical and real-time asset data, replacing a top-down approach; used across teams for network planning.
- Modelled grid evolution to 2050 under 4 future energy scenarios.

Data Scientist (DSO) **May–September 2024**

- Built an end-to-end pipeline forecasting short-term load across ∼800 substations from half-hourly meter data, with Akima and lag-based gap-filling.
- Showed that substations clustered by DTW k-means share forecastable structure: one model per cluster generalised across all members, reducing ∼800 models to 6.
- Designed and tuned TCN and BiTCN models with exogenous features; results presented at CIRED 2025 as first author.

Data Analyst (System Forecasting) **May–August 2023**

- Built a statistical demand model for ∼4M customers on low-voltage networks using SQL and Python, informing short- and long-term business planning.

Skills

- **Research:** tensor networks (MPS), quantum-inspired and probabilistic modelling, time-series forecasting, ML, model evaluation
- **Programming:** Python (numpy, pandas, scikit-learn, PyTorch), Julia (ITensors.jl), SQL, R, Rust, C/C++
- **Tools:** Git, GNU/Linux, PostgreSQL, LaTeX **Languages:** English (native), German (B1)