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QUALIFICATIONS

Sep 21 - Sep 25	PhD Computer Science (Supervised by Dr. Nafise Sadat Moosavi) Natural Language Processing Group, University of Sheffield, United Kingdom <u>Research title:</u> <i>Numerical Reasoning for General-Purpose Language Models</i> <u>Focus:</u> AI, ML, NLP, NLG, LLMs, Reasoning, Number Representation Learning, Tokenisation
Sep 20 - Sep 21	MA Computational Linguistics - Distinction University of Wolverhampton, United Kingdom
Sep 16 - Sep 17	PGCE Secondary Education (Mathematics) University of Cambridge, United Kingdom
Oct 12 - Jul 16	Bachelor (MMath) Mathematics – First Class University of Warwick, United Kingdom

PUBLICATIONS

1. [FERMAT: An Alternative to Accuracy for Numerical Reasoning](#) (Sivakumar & Moosavi, ACL 2023)
 - ▷ Created more mathematical informative multi-view test sets for numerical reasoning in NLP to judge specific mathematical capabilities of models both in terms of numbers and operations, performed zero-shot evaluation of existing mathematics models, provided method for automatic data-augmentation of worded arithmetics problems to fine-tune models, demonstrated that diversity in language and mathematics representation significantly improve performance of FLAN, BART and T5 type LLMs, explored data-leakage to support improvement
2. [A GRU-based Pipeline Approach for Word-Sentence Segmentation and Punctuation Restoration in English](#) (Sivakumar, Muga, Spadavecchia, White & Can, IALP 2021)
 - ▷ Train separate GRU architectures using PyTorch to retrieve spaces, period, comma and capital letter for unformatted text, create binary classification models on bigrams to identify insertion of aspect of interest, generate synthetic data for training the recovery of each aspect, investigate different evaluation metrics considering which align with improved human perception

RESEARCH ACTIVITIES

Sep 21 - Present	NLP for Endangered Language Revitalisation <ul style="list-style-type: none">▷ Collect and digitise text data using OCR for Palenquero, an endangered language of Colombia. Deploy low-resource language NLP research to develop pedagogical resource
Nov 21 - Jun 22	Speech Technology and NLP to improve Oral History Search functionality <ul style="list-style-type: none">▷ Worked with Legasee, an oral history video archive, trained latest ASR systems on elderly speech and explore NER systems to identify domain specific terms to produce annotated transcripts to better search and retrieve video based on timestamps
Sep 20 - Sep 21	Dissertation in Computational Linguistics (Supervised by Dr. Burcu Can) <ul style="list-style-type: none">▷ “Improved Sentence Embeddings Using GAT with Siamese Neural Networks on UCCA Semantic Parse Trees”, trained BERT embeddings with contrastive loss using Graph Neural Networks over parse trees to learn improve semantic representation of sentence embeddings for a downstream NLU task
Sep 15 - May 16	Dissertation in Mathematics (Supervised by Dr. Hugo Van den Berg) <ul style="list-style-type: none">▷ “A Mathematical Approach at Analysing the Influence of English in the French Language”, collected news articles to generate a diachronic dataset and mathematically modelled the adoption of English lexica in French using stochastic and differential equations, analysed and explained trends using historical context

SKILLS

Programming

- Python (PyTorch, Huggingface, scikit-learn, NLTK)
- MATLAB
- Bash (HPC)
- Latex
- Version control (git/github)

Languages

- French (Native)
- Tamil (Native)
- English (Near Native)
- Spanish (Fluent)
- German (Conversational)

ACADEMIC ACTIVITIES

Nov 23 - Present	Transformers Workshop for Undergraduates <ul style="list-style-type: none">▷ Teaching the latest deep learning techniques both theoretically and practically
Jun 23	Invited Talk - 3rd Speech and Language Technology CDT Conference <ul style="list-style-type: none">▷ Presented FERMAT research in main talk event
Mar 23 - May 23	Supervisor for final year research project in NLP and representation learning <ul style="list-style-type: none">▷ “How much does the number representation matter in downstream applications?”
Nov 22 - Feb 23	Examiner for Text Processing and Professional Issues <ul style="list-style-type: none">▷ Assessed student code and marked reports, provided feedback on assignments
Jul 22	12th Lisbon Machine Learning Summer School <ul style="list-style-type: none">▷ Attended lectures on linear classifiers, seq2seq models, neural networks and talks from industry and academia on novel research, networked with other attendees
Jan 22 - Jun 22	Teaching Assistant for Foundations of Computer Science <ul style="list-style-type: none">▷ Taught mathematical foundations such as probability, linear algebra and number theory
Jan 21 - May 21	Machine Learning Tutorial for Postgraduate Computational Linguists <ul style="list-style-type: none">▷ Explained mathematics using linguistics examples for kNN, decision trees, Naive Bayes, linear regressions, regularisation, beam search, EM algorithm, gradient descent, entropy