Abhijnan Nath

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Education

- **Colorado State University, Fort Collins**
  PhD in Computer Science *January2021 - Present*
  Awarded MS in Computer Science in Dec, 22
  Courses: *Analysis Of Algorithms, Natural Language Processing, Machine Learning, Distributed Systems, Databases*

- **Birla Institute of Technology and Science, Pilani, India**
  Master of Science:Physics *Aug2009 - Aug2013*

Skills Summary

- **Languages**: Python, Scala, C++, JavaScript, SQL, Bash, JAVA
- **Frameworks**: PyTorch, NLTK, SpaCy, TensorFlow, Keras, Django, Flask, NodeJS, LAMP
- **Tools**: Kubernetes, Docker, Apache Spark,GIT, PostgreSQL, MySQL, SQLite

Experience

- **Signal Lab CSU, DARPA-AIDA collaboration with CU Boulder** On-campus
  Graduate Research Assistant under Dr. Nikhil Krishnaswamy *Dec 2021 - present*
  - **Cross Document Coreference Resolution**: Developed end-to-end pipeline for neural (embedding-based and lexical) CDCR for events and entities. Delivered Docker images for building semantic knowledge graphs, implemented clustering methods on coreference links.
  - **Canonical Language Embedding Space**: Designed and implemented the affine-mapping based semantic transfer pipeline from various BERT-type Language Models (LM) to enhance CDCR results. Explored canonical properties of LMs.
  - **PhonoBERT**: Designed a novel Transformer-based Language Model for Assamese (a Low-Resource Language) that leverages articulatory features and evaluated on IndicGLUE tasks.

- **Natural Resource Ecology Lab, CSU and Jackson Lab, Stanford University** On-campus
  Machine Learning Engineer *Jan 2021 - Aug 2021*
  * **Time-Series Modelling**: Built first-ever production-level LSTM model pipelines to predict Nitrous Oxide levels for Australian agricultural sites.
  * **Study of Covariate combinations**: Collaborated with the Jackson Lab crew at Stanford University to analyze importance of various covariates in predicting N20.

Publications

- **A Generalized Method for Automated Multilingual Loanword Detection.**: Abhijnan Nath, Sina Mahdipour Saravani, Ibrahim Khebour, Sheikh Mannan, Zihui Li and Nikhil Krishnaswamy. In International Conference on Computational Linguistics (COLING). ACL. 2022 paper
- **Phonetic, Semantic, and Articulatory Features in Assamese-Bengali Cognate Detection.**: Nath, A., Ghosh, R., and Krishnaswamy, N. (2022). In Workshop on NLP for Similar Languages, Varieties, and Dialects (VarDial). ACL. 2022 paper
- **Linear Mappings: Semantic Transfer from Transformer Models for Cognate Detection and Coreference Resolution.**: Nath, Abhijnan. MS Thesis. Colorado State University, 2022. paper

In-review

- **PhonoBERT: Leveraging Articulatory Signals for LRL Neural Modelling**: first-author, in-review
- **Don't Eat That Frog, Start with a Bagel: An Easy-first, Scalable Cross-Document Coreference Resolution Method for Trimming the Long-Tail**: co-author, in-review
- **How Good is a Recommender in Machine-Assisted Cross Document Event Coreference Resolution Annotation?**: co-author, manuscript ready.

Projects

- **Best-Lift Predictor**: Successfully modelled the best (third) lift in power-lifting tournaments that competitive lifters can use to optimize their lifts. Tech: Python, Numpy, TensorFlow (Feb-May '21)
- **Distributed Twitter Feed Analysis using Apache Storm** : Implemented a distributed approximate on-line algorithm using a real-time streaming data-processing framework by using parallelism . Tech: Java, Apache Storm.(Feb-March '21)
- **Kharkhua-Neural Translation Model for Low-Resource Language**: Built a seq-to-seq Transformer model for neural translation from scratch using PyTorch for a low-resource inflected language like Assamese. (Oct'21 to Nov'21)

Positions of Responsibility/Extracurriculars

- Pioneered a multi-lingual progressive rock band from North-East India Featured along with 'Metallica' in Rock Street Journal (Aug, 2012 edition).
- Led the college music club (40 members) in various inter-college music fests 2011-12.
- Organized sponsorship drive to raise 6000 USD worth of instruments noting participation of 20 national bands.
- Co-organized and supervised 32 multi-lingual music concerts for a diverse audience over 4 years.