Tung "Tommy" Tran, Ph.D. — Curriculum Vitae

Contact Information

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Locality

Resident of the Tampa Bay area in Florida. US Citizen.

Research Interests

Machine Learning; Deep Neural Networks; Natural Language Processing; Information Extraction; Biomedical Informatics; Text and Image Classification and Analysis

Education

Ph.D. in Computer Science, University of Kentucky, Lexington, KY, USA **2014–2020**

↳ Dissertation Advisor: Ramakanth Kavuluru, Ph.D.

- Dissertation: "Deep Neural Architectures for End-to-End Relation Extraction"
- Graduated with G.P.A. of 4.0 out of 4.0

B.S. in Computer Science, University of Kentucky, Lexington, KY, USA **2010–2014**

- Graduated **Cum Laude** with G.P.A. of 3.5 out of 4.0

Professional Experience

IDS International, Cyber & Information Warfare Division, Arlington, VA

Senior AI/NLP Engineer **10/2021–Present**
AI/NLP Engineer **08/2020–10/2021**

- Developed methods for automatic content generation, for the purpose of social media environment replication, including face generation and natural language text generation
- Developed methods for social media content analysis including automatic spam detection, bot detection, and image object recognition

Research Experience

University of Kentucky, Computer Science Department, Lexington, KY

Graduate Research Assistant **09/2016–08/2020**

- Developed methods for predicting mental conditions based on narratives from clinical notes
- Developed methods for end-to-end relation extraction from free text in various domains

Undergraduate Research Assistant **2011–2012**

- Worked on applying **answer set programming** to the problem of database query optimization

U.S. National Institutes of Health (NIH), National Library of Medicine, Bethesda, MD

Summer Research Intern **06/2018–09/2018**

↳ Mentor: Halil Kilicoglu, Ph.D.

- Developed joint-learning model for extracting drugs and their interactions from drug labels
- Applied deep learning to the analysis of citation sentiment in clinical research articles

Teaching Experience

University of Kentucky, Computer Science Department, Lexington, KY

Graduate Teaching Assistant **2014–2016**

↳ CS215 – Introduction to Program Design, Abstraction, and Problem Solving

- Taught as a lab instructor in Fall 2014, Spring 2015, Fall 2015, and Spring 2016

Publications in Progress

- **T. Tran** and R. Kavuluru. Neural Metric Learning for Fast End-to-End Relation Extraction. (preprint)

Refereed Journal Publications

1. **T. Tran**, M. Ickes, J. W. Hester, and R. Kavuluru. Predicting Current Juul use among Emerging Adults through Twitter Feeds. **International Journal of Medical Informatics**, 2021. (preprint) (publisher)
2. **T. Tran**, R. Kavuluru, and H. Kilicoglu. Attention-Gated Graph Convolutions for Extracting Drug Interaction Information from Drug Labels. **ACM Transactions on Computing for Healthcare (ACM Health)**, 2021. (preprint) (publisher)
3. **T. Tran** and R. Kavuluru. Social Media Surveillance for Perceived Therapeutic Effects of Cannabidiol (CBD) Products. **International Journal of Drug Policy**, 2020. (preprint) (publisher)
4. **T. Tran** and R. Kavuluru. Distant Supervision for Treatment Relation Extraction by Leveraging MeSH Subheadings. **Artificial Intelligence in Medicine**, 2019. (preprint) (publisher)
5. H. Kilicoglu, Z. Peng, S. Tafreshi, **T. Tran**, G. Rosemblat, and J. Schneider. Confirm or Refute?: A Comparative Study on Citation Sentiment Classification in Clinical Research Publications. **Journal of Biomedical Informatics**, 2019. (publisher)
6. R. Doğan, S. Kim, A. Chatr-aryamontri, C. Wei, D. Comeau, and **22** others, including **T. Tran**. Overview of the BioCreative VI Precision Medicine Track: mining protein interactions and mutations for precision medicine. **Database: Journal of Biological Databases and Curation**, 2019. (publisher)
7. A. Sarker, M. Belousov, J. Friedrichs, K. Hakala, S. Kiritchenko, F. Mehryary, S. Han, **T. Tran**, and **8** others. Data and systems for medication-related text classification and concept normalization from Twitter: Insights from the Social Media Mining for Health (SMM4H) 2017 shared task. **Journal of the American Medical Informatics Association**, 2019. (publisher)
8. **T. Tran** and R. Kavuluru. An End-to-End Deep Learning Architecture for Extracting Protein-Protein Interactions Affected by Genetic Mutations. **Database: Journal of Biological Databases and Curation**, 2018. (publisher)
9. **T. Tran** and R. Kavuluru. Predicting Mental Conditions Based on "History of Present Illness" in Psychiatric Notes with Deep Neural Networks. **Journal of Biomedical Informatics**, 2017. (preprint) (publisher)

Conference and Workshop Publications

10. **T. Tran**, R. Kavuluru, and H. Kilicoglu. A Multi-Task Learning Framework for Extracting Drugs and Their Interactions from Drug Labels. In Proceedings of **The Eleventh Text Analysis Conference** (TAC), 2018. (report)
11. A. Rios, **T. Tran**, and R. Kavuluru. Predicting Psychological Health from Childhood Essays with Convolutional Neural Networks for the CLPsych 2018 Shared Task (Team UKNLP). In Proceedings of **The Fifth Workshop on Computational Linguistics and Clinical Psychology: From Keyboard to Clinic** (CLPsych), 2018. (publisher)
12. **T. Tran** and R. Kavuluru. Supervised Approaches to Assign Cooperative Patent Classification (CPC) Codes to Patents. In Proceedings of **The Fifth International Conference on Mining Intelligence and Knowledge Exploration** (MIKE), 2017. (preprint) (publisher)
13. **T. Tran** and R. Kavuluru. Exploring a Deep Learning Pipeline for the BioCreative VI Precision Medicine Task. In Proceedings of **The BioCreative VI Workshop**, 2017. (report) (proceedings)
14. S. Han, **T. Tran**, A. Rios, and R. Kavuluru. Team UKNLP: Detecting ADRs, Classifying Medication In-take Messages, and Normalizing ADR Mentions on Twitter. In Proceedings of **The 2nd Social Media Mining for Health Applications Workshop and Shared Task at AMIA** (SMM4H), 2017. (report)
15. R. Kavuluru, A. Rios, and **T. Tran**. Extracting drug-drug interactions with word and character-level recurrent neural networks. In Proceedings of **The Fifth IEEE International Conference on Healthcare Informatics, Workshop on Healthcare Knowledge Discovery and Management** (ICHI), 2017. (preprint) (publisher)

Grant Activity (neither PI nor co-PI)

Developed core proposal ideas and co-authored grant proposal draft. (NIH R01LM013240).
"Advanced End-to-End Relation Extraction with Deep Neural Networks."
PI: Ramakanth Kavuluru. Awarded $1,356,734 from 2020 to 2024. (details)

Technical Skills

Python; Tensorflow; Keras; PyTorch; Word2Vec; GloVe; Scikit-learn; NLTK; Numpy; Pandas; Huggingface (transformers) library; Linux; Bash; Docker; Kubernetes; Elasticsearch, MongoDB; HTML; JavaScript; CSS

Certifications

Machine Learning - Stanford University. Issued by Coursera in May 2015. (certificate)

Awards and Honors

2019 — Departmental Fellowship for the 2019–2020 Academic Year, Computer Science, UKY
2018 — Ranked **2nd out of 8 teams** in the shared task on DDI extraction (TAC 2018)
2018 — Biomedical Informatics Training Program Appointee, U.S. National Library of Medicine
2017 — Ranked **2nd out of 6 teams** in the shared task on PPI extraction (BioCreative VI)
2016 — Graduate School Travel Grant, UKY
2015 — Departmental Nominee for the Microsoft PhD Fellowship Program, Computer Science, UKY
2014 — Graduated Cum Laude, B.S. in Computer Science, UKY
2010-2014 — Dean's List for Three Semesters, UKY

2010-2014 — Kentucky Educational Excellence Scholarship (KEES)

2010 — Academic Competitiveness Grant

2010 — Catalyst Scholarship

Professional Service and Activities

Reviewer, 2× Empirical Methods in Natural Lang. Processing (EMNLP) Conference	**2018–2020**
Reviewer, 3× Bioinformatics Journal	**2018–2020**
Reviewer, 6× American Medical Informatics Association (AMIA) Annual Symposium	**2019**
Reviewer, 1× Scientometrics (SCIM) Journal	**2018**
Reviewer, 1× Journal of Biomedical Informatics (JBI)	**2017**
Member, American Medical Informatics Association (AMIA)	**2016–Present**
Member, Association for Computing Machinery (ACM)	**2010–Present**
Member, Chair Search Committee, Computer Science Department, UKY	**2013**
Chapter President, ACM Student Chapter, UKY	**2012-2013**
Engineering Student Council (ESC) Representative, ACM Student Chapter, UKY	**2011-2012**
Member, ACM Student Chapter, UKY	**2010-2014**

Invited Talks and Other Presentations

1. **An End-to-End Deep Learning Architecture for Extracting Protein-Protein Interactions Affected by Genetic Mutations.**, George Washington University (GWU) Informatics Seminar, September 2018.
2. **A Multi-Task Learning Framework for Extracting Drugs and Their Interactions from Drug Labels.**, U.S. National Institutes of Health (NIH) Summer Poster Day, August 2018. **(Poster)**
3. **Exploring a Deep Learning Pipeline for the BioCreative VI Precision Medicine Task.**, BioCreative VI Workshop, October 2017.
4. **Extracting drug-drug interactions with word and character-level recurrent neural networks.**, Fifth IEEE International Conference on Healthcare Informatics (ICHI), Workshop on Healthcare Knowledge Discovery and Management, August 2017.
5. **Prediction of Psychiatric Conditions Based on "History of Present Illnes" from Psychiatric Notes**, 2016 CEGS N-GRID Shared-Tasks and Workshop on Challenges in Natural Language Processing for Clinical Data, November 2016.

Open Source Software

Personal Repository: https://github.com/tttr222

2018 — **Protein-Protein Interaction Extractor.** A deep learning based pipeline for end-to-end extraction of protein-protein interactions affected by genetic mutations.

2017 — **Autumn Named Entity Recognition (NER).** A standalone deep neural network model for named entity recognition (NER).

2017 — **Drug-Drug Interaction (DDI) Extractor.** A deep neural network model for relation extraction of drug-drug interactions.

2017 — **Patent Data Harvester and Parser.** A system for harvesting full-text patents (and their CPC codes) from the USPTO website and parsing them to a machine-readable format.

2017 — **Adverse Drug Reaction (ADR) Mention Normalizer.** A deep neural network model for concept normalization of adverse drug reaction (ADR) mentions.