Anthony Rios | Assistant Professor

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Research Interests

Machine Learning; Natural Language Processing; Neural Networks; Biomedical Informatics; Computational Social Science

Education

University of Kentucky
Ph.D. in Computer Science
Advisor: Ramakanth Kavuluru, Ph.D. *2012–2018*

Georgetown College
B.S. in Computer Science *2007–2011*

Professional Experience

University of Texas at San Antonio
Assistant Professor in Information Systems and Cyber Security *2018–present*

National Institute of Health (NCBI/NLM/NIH)
Summer Research Fellow
Supervisor: Zhiyong Lu, Ph.D. *Summer 2017*

University of Kentucky
Graduate Research Assistant *2013–2018*

Awards

2017 – Best poster, Annual Commonwealth Computational Summit

2017 – Ranked 1st in the BioCreative text mining chemical-protein interactions (CHEMPROT) shared task

2017 – Ranked 2nd in the shared task on classification of medication intake messages on Twitter for online pharmacovigilance (at Social media mining for health workshop at AMIA)

2017 – NIH Intramural Research Training Award (IRTA)

2016 – Ranked 3rd in the CEGS NGRID shared task on predicting psychiatric symptom severity scores based on clinical notes (RDoC for Psychiatry workshop at AMIA)

2016 – Graduate School Travel Grant, University of Kentucky

2015 – Thaddeus B. Curtz Memorial Scholarship, University of Kentucky

2015 – Best paper nomination, IEEE International conference on healthcare informatics, IEEE ICHI 2015.

2015 – Ranked 2nd in the Annual BioASQ Semantic Indexing Challenge, Task A (Batch 2)

2014 – Distinguished poster nomination, American Medical Informatics Assoc. (AMIA) Annual Symposium

2011 – Outstanding Senior in Computer Science, Georgetown College

Peer-Reviewed Journal Publications

Impact factors are from the year the article was published.

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.
Abeed Sarker et al. (with Tung Tran, *Anthony Rios*, and Ramakanth Kavuluru).
To appear: Journal of the American Medical Informatics Association (JAMIA), 2018.
(Impact Factor: **4.270**)

Extracting chemical-protein relations with ensembles of SVM and deep learning models.
Yifan Peng, *Anthony Rios*, Ramakanth Kavuluru, and Zhiyong Lu.
Database: The Journal of Biological Databases and Curation, 2018.
(Impact Factor: **3.290**)

Generalizing Biomedical Relation Classification with Neural Adversarial Domain Adaptation.
Anthony Rios, Ramakanth Kavuluru, and Zhiyong Lu.
Bioinformatics, 2018.
(Impact Factor: **7.307**)

Ordinal Convolutional Neural Networks for Predicting RDoC Positive Valence Psychiatric Symptom Severity Scores.
Anthony Rios and Ramakanth Kavuluru.
Journal of Biomedical Informatics, 2017.
(Impact Factor: **2.753**)

An Empirical Evaluation of Supervised Learning Approaches in Assigning Diagnosis Codes to Electronic Medical Records.
Ramakanth Kavuluru, *Anthony Rios*, and Yuan Lu.
Artificial Intelligence in Medicine, 2015.
(Impact Factor: **2.009**)

Peer-Reviewed Conference Publications

For computer science publication venues, conference proceedings are highly selective (20%-40% acceptance rates), and are considered prestigious - sometimes **more prestigious than journals**. Therefore, highly-selective conferences are generally considered the most respected publication venues within certain communities such as natural language processing (e.g., ACL, NAACL, and EMNLP).

Few-Shot and Zero-Shot Multi-Label Learning for Structured Label Spaces.
Anthony Rios and Ramakanth Kavuluru.
In: Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing (EMNLP 2018).
(Acceptance Rate: **25%**)

EMR Coding with Semi-Parametric Multi-Head Matching Networks.
Anthony Rios and Ramakanth Kavuluru.
In: Proceedings of the 2018 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies, Volume 1 Long Papers (NAACL 2018).
(Acceptance Rate: **32%**)

Predicting Psychological Health from Childhood Essays with Convolutional Neural Networks for the CLPsych 2018 Shared Task.
Anthony Rios, Tung Tran, and Ramakanth Kavuluru.
In: Proceedings of the Computational Linguistics and Clinical Psychology Workshop (CLPsych@NAACL 2018).

Team UKNLP: Detecting ADRs, Classifying Medication In-take Messages, and Normalizing ADR Mentions on Twitter.

Sifei Han, Tung Tran, *Anthony Rios*, Ramakanth Kavuluru.
In: Proceedings of the Social Media Mining for Health Applications Workshop at AMIA (SMM4H@AMIA 2017).

Chemical-protein relation extraction with SVM, CNN, RNN and ensemble systems.
Yifan Peng, *Anthony Rios*, Ramakanth Kavuluru, and Zhiyong Lu.
In: Proceedings of the BioCreative Workshop, 2017.

Extracting Drug-Drug Interactions with Word and Character-Level Recurrent Neural Networks.
Ramakanth Kavuluru, *Anthony Rios*, and Tung Tran.
In: Proceedings of the Workshop on Healthcare Knowledge Discovery and Management (HKDM@ICHI 2017).

Automatic Assignment of Non-Leaf Medical Subject Headings to Biomedical Articles.
Ramakanth Kavuluru and *Anthony Rios*.
In: Proceedings of the American Medical Informatics Association Symposium (AMIA 2015).

Analyzing the Moving Parts of a Large-Scale Multi-Label Text Classication Pipeline: Experiences in Indexing Biomedical Articles.
Anthony Rios and Ramakanth Kavuluru.
In: Proceedings of the IEEE International Conference on Healthcare Informatics (ICHI 2015).
(Acceptance Rate: **28%**)

Convolutional Neural Networks for Biomedical Text Classification: Application in Indexing Biomedical Articles.
Anthony Rios and Ramakanth Kavuluru.
In: Proceedings of the ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (BCB 2015).
(Acceptance Rate: **34%**)

A Knowledge-Based Collaborative Clinical Case Mining Framework.
Ramakanth Kavuluru, *Anthony Rios*, Brandom Kulengowski, and Patrick McNamara.
In: Proceedings of the American Medical Informatics Association Symposium (AMIA 2014).

Supervised Extraction of Diagnosis Codes from EMRs: Role of Feature Selection, Data Selection, and Probabilistic Thresholding.
Anthony Rios and Ramakanth Kavuluru.
In: Proceedings of the IEEE International Conference on Healthcare Informatics (ICHI 2013).
(Acceptance Rate: **30%**)

A Multi-Label Classication Approach to Coding Cancer Information Service Chat Transcripts.
Anthony Rios, Robin Vanderpool, P. Shaw, and Ramakanth Kavuluru.
In: Proceedings of the Twenty-Sixth International AAAI-FLAIRS Conference (FLAIRS 2013).

Publications Under Review

Neural Transfer Learning for Assigning Diagnosis Codes to EMRs.
Anthony Rios and Ramakanth Kavuluru.
Under Review in: Artificial Intelligence in Medicine, 2018.

Theses

Deep Neural Networks for Multi-Label Text Classification: Application to Coding Electronic Medical Records.
Anthony Rios.
University of Kentucky, 2018.

Invited Talks

Generalizing Biomedical Relation Extraction with Neural Adversarial Domain Adaptation. Bluegrass Data Science Group, 2018.

Adversarial Discriminative Domain Adaptation for Extracting Protein-Protein Interactions from Text. Annual Commonwealth Computational Summit, 2017. (*Best Poster Award*)

Ordinal Convolutional Neural Networks for RDoc Classification. CEGS N-GRID Shared-Tasks and Workshop on Challenges in Natural Language Processing for Clinical Data, 2016.

Convolutional Neural Networks for Biomedical Text Classification: Applications in Indexing Biomedical Articles, Keeping Current, University of Kentucky, and Lexmark International 2016.

Multi-label Collective Classification, Keeping Current, University of Kentucky, Department of Computer Science 2014.

Data Science Workflow with IPython Notebook, Keeping Current, University of Kentucky, Department of Computer Science 2014.

Sick Jump: Maximizing Vertical Air to Optimize Tricks on a Half-pipe. Kentucky Section of the MAA Annual Meeting, Eastern Kentucky University, 2011.

Teaching Experience

University of Texas at San Antonio **Instructor**
Data Foundations *Fall 2018*

University of Kentucky **Guest Lecturer**
Biomedical Natural Language Processing *Fall 2016*

Georgetown College **Tutor**
Computer Science Peer Tutor *2010–2011*

Industrial Experience

MAKETIME Inc. (Now Xometry)
Data Scientist *2016–2018*

Lexmark International
Software Engineer Intern/Co-op *2010–2013*

Corevalus Systems LLC.
Software Engineer Intern *Spring 2010*

Professional Memberships and Activities

Reviewer for the Journal of Biomedical Informatics (JBI)

Reviewer for the Information Sciences Journal

Reviewer for the Bioinformatics Journal

Reviewer for the American Medical Informatics Association Annual Symposium (AMIA)

Member of the American Medical Informatics Association (AMIA)

Reviewer for IEEE Access

Reviewer for IEEE TrustCom

Member of the Association for Computational Linguistics

Students Advised

University of Texas at San Antonio

Nayeema Nasrin, (Fall 2018-present), IS Ph.D.

Yuhe Ding, (Fall 2018-present), IS Ph.D.

Service to the University of Texas at San Antonio

Information Systems Faculty Search Committee, 2018–present

Information Systems Undergraduate Programs Committee, 2018–present

Selected Open Source Software `https://github.com/AnthonyMRios`

pyMetaMap – Python interface for the widely used named entity recognition tool (MetaMap) by the National Library of Medicine.

pyClausIE – Python interface for the OpenIE tool ClausIE.

relation-extraction-rnn – Python package including a Bi-directional LSTM method for relation extraction.

LEML – Python package for a matrix factorization-based method for extreme mulit-label classification.

advRelCNN – Python package including a method for unsupervised domain adaptation for relation classification.