Linting Xue

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RESEARCH FOCUSE

Deep learning for natural language processing/understanding.

EDUCATION

Ph.D. in **Computer Science**	North Carolina State University	2015 - expected 2020
M.S. in **Mechanical Engineering**	Wilkes University	2012 - 2014
B.E. in **Electrical Engineering**	Shanghai University of Electric Power, China	2006 - 2010

INDUSTRIAL EXPERIENCES

Attentional DAG Encoder Model for Short Text/Intents Classification 05/2018 - 08/2018

Software Engineer Intern in Google Assistant Team, Google, San Francisco, CA, USA

- Implemented DAG encoder model (extension from linear-chained LSTM) to incorporate annotations (e.g. hypernyms, Named Entity, synonyms) to deep neural network.
- Implemented hard attention layer on DAG encoder using Gumbel Softmax to improve model efficiencies.
- DAG encoder model outperformed the baseline model of LSTM.
- Hard attention improved model efficiency by skipping unimportant annotations/tokens.

Skills: Natural language understanding TensorFlow NLTK Colab Python

RESEARCH EXPERIENCES

Identifying Argument Structures to Support Automated Essay Grading 10/2017 - present

- Applying DAG-structured RNN to incorporate discourse annotations and other features (e.g. POS tagging, Named Entity, N-grams) into deep neural network for argument component classification and argument relationship detection.
- Build End-to-End model to parse argument structures from student-produced essays utilizing LSTM and CNN model.

Skills: Text mining TensorFlow Scikit-learn Pandas NLTK Python

Pattern Recognition on Argument Diagrams for Automated Essay Grading 08/2015 - 07/2017

- Applied graph mining algorithms (e.g. Subdue, gSpan) on student-produced argument diagrams to induce graph patterns/rules correlated with diagram grades.
- Implemented evolutionary computation (EC) with novelty selection to induce novel rules.
- EC induced 50% more rules with better performance compared to *expert* rules and rules induced by Subude and gSpan.
- The induced rules can be used to build an automated argument diagram grading system.

Skills: Machine learning C++ Python Matplotlib MySQL

Social Network Analysis on Student Online Interaction Data 02/2017 - 07/2017

- Investigated the correlation between social metrics and students' grades.
- Built an early warning system to help students on track.

Skills: Social network analysis Python

COURSE PROJECTS

Neural Activities Detection by Classifying the Data of EEG Signals 08/2016 - 12/2016

- Led project to detect neural activities using deep learning (Deep Belief Network).
- Achieved 26% improvement in accuracy over SVM and logistic regression.

Image Classification on CIFAR-10 Dataset 08/2015 - 12/2015

- Led project to classify images using deep learning (CNN, and Stacked Autoencoders).
- Achieved 30% improvement in accuracy over PCA+SVM.

CONFERENCE ORGANIZATION

Co-chaired the third international workshop on Graph-based Educational Data Mining, 2017.

PUBLICATIONS

[1] **Xue, Linting**, Collin F. Lynch, and Min Chi. "*Mining Innovative Augmented Graph Grammars for Argument Diagrams through Novelty Selection*." In Proceeding of the 10th Conference on Educational Data Mining, pp. 296 - 300. (2017)

[2] Gitinabard, Niki, **Linting Xue**, et al. "*Social Network Analysis on Blended Courses*." The Third International Workshop on Graph-Based Educational Data Mining. (2017)

[3] **Xue, Linting**. "*Intelligent Argument Grading System for Student-produced Argument Diagrams*." Doctoral Consortium on the 10th Conference on Educational Data Mining. (2017)

[4] **Xue, Linting**, Collin Lynch, and Min Chi. "*Unnatural Feature Engineering: Evolving Augmented Graph Grammars for Argument Diagrams*." In Proceeding of the 9th Conference on Educational Data Mining, pp. 255 - 262. (2016)

[5] Lynch, Collin F., **Linting Xue**, and Min Chi. "*Evolving augmented graph grammars for argument analysis*." In the proceedings of the 2016 on Genetic and Evolutionary Computation Conference Companion, ACM, pp. 65 - 66. (2016).

[6] **Xue, Linting**, Collin F. Lynch, and Min Chi. "*Graph Grammar Induction via Evolutionary Computation*." The Second International Workshop on Graph-Based Educational Data Mining. (2015)

[7] Zhang, Xiaoli, **Linting Xue**, et al. "*Digital human modeling for ergonomic evaluation of patient table height*." Robotics and Biomimetics (ROBIO), 2013 IEEE International Conference on, IEEE, pp. 1480 - 1485. (2013)

[8] Li, Songpo, Jiucai Zhang, **Linting Xue**, et al. "*Attention-aware robotic laparoscope for human-robot cooperative surgery*." Robotics and Biomimetics (ROBIO), 2013 IEEE International Conference on, IEEE, pp. 792 - 797. (2013)

HONORS & AWARDS

- Merit Student Award from Shanghai Education Bureau in China *(Top 1%)* 2010
- The 2nd prize of National Freescale Cup Intelligent Car Competition *(Top 1%)* 2009
- Undergraduate Student Merit Award *(Top 3%)* 2010
- Outstanding Undergraduate Thesis awards *(Top 3%)* 2010
- Undergraduate Scholarship *(Top 8%)* 2008
- National Encourage Scholarship *(Top 3%)* 2007

REFERENCES

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