Andrea Madotto

Email: amadotto@connect.ust.hk
Website: andreamad8.github.io

EDUCATION

The Hong Kong University of Science and Technology, Hong Kong
Ph.D. candidate in Electronic & Computer Engineering, 2018 - present

University of Pisa, Italy
Master's Degree in Computer Science, 2015 - 2017 Final mark: 110/110 (Honours)

EXPERIENCE

Data Science Intern UberAI
Jun 2019 – Sept 2019 San Francisco, CA
Conducting research on text-based games (i.e. TextWorld) using reinforcement learning (RL) algorithms. I am mainly working on exploration-based algorithms (e.g. Go-Explore) for improving model-free RL performance in large action space environments.

Research Assistant HKUST
Sept 2017 – Sept 2018 Hong Kong, HK
Conducted research on Deep Learning Algorithms at the HKUST Centre for Artificial Intelligence Research (CAiRE). I mainly worked on building end-to-end architectures to model dialogue responses. Especially:

- End-to-End dialogue systems using Memory Augmented Neural Networks
- Multi-Task learning for Emotion Representation and Code-Switching

Teaching Assistant HKUST
Feb 2018 – May 2018 Hong Kong, HK
TA of Building Interactive Intelligent Systems (a.k.a. Deep Learning for NLP), join course of the B.Sc. in CSE and ECE held in the The Hong Kong University of Science and Technology.

- taught and prepared most of the tutorial classes and exercises
- prepared several lectures, in particular RNN (Seq2Seq etc.) and Word Embedding

PROFESSIONAL ACTIVITIES

Program Committee and Reviewer Association for Computational Linguistics (ACL 2019)
Reviewer North American Association for Computational Linguistics (NAACL 2019) Empirical Methods in Natural Language Processing (EMNLP 2019)

SELECTED PUBLICATIONS

Chien-Sheng Wu, **Madotto, A.**, Ehsan Hosseini-Asl, Caiming Xiong, Richard Socher, Pascale Fung (2019). Transferable Multi-Domain State Generator for Task-Oriented Dialogue Systems. Accepted at Association for Computational Linguistics (**ACL**) 2019, **Oral and Outstanding Award (Top 0.1% of the submission)**. Link: https://www.aclweb.org/anthology/P19-1078.

Madotto, A., Zhaojiang Lin, Chien-Sheng Wu, Pascale Fung (2019).Personalizing Dialogue Agents via Meta-Learning. Accepted at Association for Computational Linguistics (**ACL**) 2019. Link: https://www.aclweb.org/anthology/P19-1542.

Jamin Shin, **Madotto, A.**, Fung, P. (2019). Interpreting Word Embeddings with Eigenvector Analysis. **NeurIPS** IRASL Workshop-2018, **Oral**.
Link: https://openreview.net/forum?id=rJfJiR5ooX.

Madotto, A., Wu, CS., Fung, P. (2018). Mem2Seq: Effectively Incorporating Knowledge Bases into End-to-End Task-Oriented Dialog Systems. Accepted at Association for Computational Linguistics (**ACL**) 2018. Link: http://aclweb.org/anthology/P18-1136.

Wu, CS., **Madotto, A.**, Winata, GI., Fung, P. (2018). End-to-End Dynamic Query Memory Network for Entity-Value Independent Task-Oriented Dialog. International Conference on Acoustics, Speech and Signal Processing (**IEEE-ICASSP**).
URL: https://ieeexplore.ieee.org/abstract/document/8461426.

Madotto, A and Liu, J. Super-Spreader Identification Using Meta-Centrality. **Nature** Scientific Report 6, 38994; DOI: 10.1038/srep38994 (2016).

Full list available in Google Scholar

SKILLS

Theoretical Background: Machine Learning • Deep Learning • Natural Language Processing • Algorithms • Statistical Learning • Optimization Methods
DL and ML Libraries: Pytorch, Tensorflow, Theano, Keras, Scipy, Numpy, Pandas, SciKit learn
Programming: Python • C++ • LaTeX• JavaScript • Matlab (basic) • Java (basic)
Data bases: SQL • MySQL • PostgreSQL • Xquery • neo4j
Operating Systems: Unix • Linux • Windows • Mac OS.
Languages: Italian (mother tongue) • English (IELTS 6.5) • Chinese (basic)

THESIS

Question Dependent Recurrent Entity Network for Question Answering: Master degree thesis: a memory network model for question answering that requires reasoning.

- extensive literature review of question answering models.
- modified and improved the core component of the original Recurrent Entity Network.
- experimented the proposed model in bAbI task and CNN news article datasets.
- improved state-of-the-art in bAbI tasks (1K setting)

Facility location problem in a bi-dimensional mesh: Bachelor degree thesis: finding the optimal position of one or more facilities in a bi-dimensional mesh, using the Manhattan distance.

- found the optimal position of a maximum of two facilities with a closed formula
- placed three facilities using two heuristic algorithms: one finds an almost optimal solution with a quadratic cost, and the other one finds a good approximation with a linear cost

PROJECTS

Jacobi Method: A parallel version of the Jacobi Iterative Method.

- implemented three versions of the code using C++: sequential, Pthread based, and using FastFlow library
- evaluation conducted using different metrics such as Completion Time, Scalability, Speed up, and Efficiency.
- conducted experiments using a Xeon Phi coprocessor (60 cores 4 contexts)

PythonITA: A fork of the Cpython repository to use Italian keywords as native constructors.

- modified the language interpreter, such as: the EBNF grammar (i.e. adding new production), the AST, and the built-in functions.
- modified the IDLE to highlight and predict the new added words.

Dynamic HTML render and a Recursive Descent Parser: Implementation of a Web Components library similar to React.JS.

- implemented an efficient representation of a Virtual DOM
- optimised the DOM element render in the HTML page.
- implemented a recursive descent parser to express components in JSX.

Others have a look on my personal website and my GitHub.

VOLUNTEER ACTIVITIES

Mentor CODERDOJO
Feb 2016 – Jun 2017 Pisa, IT
A volunteering activity to teach programming languages to children (mostly Scratch and Python). Pisa CoderDojo is part of the CoderDojo international initiative. I was also one of the organizers of the first Toscana DojoCon held in Pisa.