Andrea Madotto

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Passionate and dedicated to Machine Learning and Natural Language Processing. 2 years' experience in research in this area with focus on sequence processing through Recurrent Neural Networks and Memory Networks.

EDUCATION

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

University of Pisa, Italy
M.Sc. in Computer Science, 2015 - 2017   Final mark: 110/110 (Honours)

Hong Kong Baptist University, Hong Kong
M.Sc. in Advanced Information Systems, 2014 - 2015   GPA: 3.86/4

University of Perugia, Italy
B.Sc. in Computer Science, 2011 - 2014   Final mark: 110/110 (Honours)

EXPERIENCE

Research Assistant   HKUST
Sept 2017 – Sept 2018   Hong Kong, HK
Conducting 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 Recurrent Neural Network (Seq2Seq etc.)

Teaching Assistant   UniPi
Mar 2017 – Jun 2017   Pisa, IT
Advanced Programming TA of the M.Sc. in Computer Science held in University of Pisa.
- developed several seminars presented during the course, including lab exercises and class slides
- participated in the creation of writing assignments as well as grading the final exam

Adjunct Lecturer   UniPi
Jan 2017 – Mar 2017   Pisa, IT
Taught Databases course in the Specialization School in Medical Physics of
- developed course material, including lab exercises and class slides
- created writing assignments
- evaluated student course work, as well as grading the final project

Research Assistant   HKBU
Aug 2015 – Feb 2016   Hong Kong, HK
Conducted research on algorithms to predict disease spreading in Complex Networks.
- analysed Optimization Algorithms and basic Statistical Learning Theory
- designed and implemented novel algorithms for middle size Complex Networks
- teacher assistant for several courses, mainly lab classes and paper grading

PUBLICATIONS

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.

Xu. P, **Madotto, A.**, Wu, CS., Park J.H.,Fung, P. (2018). Mem2Seq: Emo2Vec: Learning Generalized Emotion Representation by Multi-task Training. Accepted at EMNLP WASSA Workshop-2018. Link: https://arxiv.org/abs/1809.04505.

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.

Wu, CS., **Madotto, A.**, Winata, GI., Fung, P. (2017). End-to-End Recurrent Entity Network for Entity-Value Independent Goal-Oriented Dialog Learning. Dialog System Technology Challenges (DSTC6). URL: http://workshop.colips.org/dstc6/papers/track1_paper02_wu.pdf.

Madotto, A. and Attardi, G. (2017). Question Dependent Recurrent Entity Network for Question Answering. NL4AI: 1st Workshop on Natural Language for Artificial Intelligence (NL4AI). URL: http://ceur-ws.org/Vol-1983/paper_07.pdf.

Attardi, G., Carta, A., Errica, F., **Madotto, A.**, and Pannitto, L. (2017). Fa3l at semeval- 2017 task 3: A three embeddings recurrent neural network for question answering. In Proceedings of the 11th International Workshop on Semantic Evaluation (SemEval-2017), pages 290295, Vancouver, Canada. Association for Computational Linguistics. URL: http://www.aclweb.org/anthology/S17-2048

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

Chiancone, A. and **Madotto, A.,** 2015. A Multistrain Bacterial Model for Link Prediction. In Proc. 11th International Conference on Natural Computation (ICNC'15).DOI: 10.1109/ICNC.2015.7378141. (Co-author and slides presentation)

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

- evaluated code version using different matrix sizes, and measures (e.g., 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.