Andrea Madotto

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EDUCATION

University of Pisa, Italy
M.Sc. in Computer Science, 2015 - now   Current GPA: 30/30

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

Adjunct Lecturer   UniPi
Jan 2017 – Mar 2017   Pisa, IT
Taught Databases course in the Specialization School in Medical Physics of Pisa University.
- 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
- deployed several data visualizations
- teacher assistant for several courses, mainly lab classes and paper grading

PUBLICATIONS

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: Algorithms ● Statistical Learning ● Optimization Methods ● Natural Language Processing ● Machine Learning
Programming: Python (Scipy, Numpy, Theano, Keras, Pandas, SciKit learn) ● C++ ● LaTeX● JavaScript ● Matlab (basic) ● Java (basic)
Data bases: SQL ● MySQL ● PostgreSQL ● Xquery ● neo4j
Operating Systems: Unix ● Linux ● Windows ● Mac OSX.
Languages: Italian (mother tongue) ● English (IELTS 6.5) ● Chinese (basic)

PROJECTS

SemEval: A group project where we designed and implemented a model for Community Question Answering. This model has been used for SemEval-2017 Task 3.
- proposed a semantic decomposition of a dependency parse tree
- designed and implemented a Recurrent Neural Network model based on such decomposition
- wrote and submitted a description paper to SemEval-2017 conference

Neural Network: An implementation of a Feed-Forward Neural Network using Theano.
- implemented Momentum and L2 regularization
- benchmarked using MONKs datasets, and compared to a Keras implementation, a linear model and a SVM/SVR (using scikit-learn)
- implemented a K-cross fold validation

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.

TagCloud Sentimental Analysis: A data visualization challenge organised by FWD Hong Kong.
- designed a Tagcloud visualization based on Google Books Ngram.
- showed the word size based on chronological relevance, and displayed the words polarity (positive or negative sentiments) with colours.

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

THESIS

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

Human Mobility and Disease Spread Simulation: Master degree final project: a disease spread simulation based on SIR model.
- implemented a computational model for contact social network.
- experimented with countermeasures to control the propagation, with a focus on the individual vaccination decision.
- simulated human mobility by flights to analyse how diseases spread in the world.

VOLUNTEER ACTIVITIES

Mentor   CODERDOJO
Feb 2016 – Present   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.

AWARDS

2015	HKBU M.Sc. AIS Best student award, ranked 1st of 100 students
2014	[FWD](FWD) Challenge Award
2014	HKBU M.sc. Fellowship Award
2014	UNIPG B.Sc. First Class Honor Award