Tony Bruguier

tony.bruguier@gmail.com (415) 830-6719
https://www.bruguier.com US & EU citizen

Education

California Institute of Technology (Caltech): PhD, Electrical Engineering

Encoding of Financial Signals in the Human Brain (https://www.bruguier.com/thesis.html)

Themes: Analysis of fMRI, inferential statistics with multiple comparisons, neurobiology, and behavioral economics. Graduated with 4.0 GPA

ESIEE, Paris: *Diplôme d'Ingénieur*, major in signal processing

Graduated valedictorian

Professional experience

Google Search

Automatic speech recognition (ASR) (Nov. 2014 - present)

- Design algorithm for pronunciation learning (with sequence-to-sequence neural networks)
- Created log mining pipeline that learns pronunciation of misrecognized words
- Near real-time new pronunciation learning from users' actions (paper)
- Neural network based language models (paper)
- Acoustic model size reduction (LSTM-CTC neural network or other) for embedded ASR (paper)

Personalized Search Engineer (Oct. 2013 – Nov. 2014)

- Natural Language Processing of Gmail messages
- Detection of event date and times
- Productionization at scale, to process messages at near real-time
- Released Google Now card (official blog post)

Search quality evaluation (Febr. 2012 – Sept. 2013)

- Offline analysis of the performance and accuracy of the search engine results
- Implementation of analysis for continuous evaluation
- Mapreduce and distributed system coding

Languages used: C++, R, Matlab, Java, and Python (for TensorFlow)

Brion Technologies (computational lithography) (Nov. 2007 – Jan. 2012)

Model R&D

- Created a Lua-scriptable EDA tool (Electronic design automation) for mask creation
- Creation of a gauge selection algorithm to lower cost of metrology (two patents)
- Created and implemented new model for resist process (patent)
- Estimation of fitting and prediction power, overfitting mitigation, and stability
- Wrote both FFTW and FPGA accelerated code

Languages used: C++, Lua, and Matlab

Philips Medical Systems (3 summers)

Summer intern in automatic medical diagnostic

- Improved on automated EKG interpretation algorithms for cardiographs
- Created proprietary vectorcardiography algorithm for measurement of QRS-T loops
- Measured effect of in-house lead transformation algorithms on diagnostic performance
- Wrote denoising and onset/offset detection algorithms using wavelets
- Wrote optical waveform recognition algorithms

Languages used: C++, C#, Basic, Matlab Unix scripts

OSC Solutions (1 summer)

First employee at startup

- Setup startup company's IT infrastructure (Setup LAN, Source Control Server)
- Used Java/WebObjects to create prototype for Enterprise Resource Planning (ERP) program

Languages used: Java, SQL, Unix scripts

More: https://www.bruguier.com/professional.html

Skills and interests

Scientific skills

Signal processing
Fourier transform, Wavelets
Information theory
Dynamic programming
Graph theory
Probability models
Optimization, numerical analysis
Descriptive and inferential statistics
Numerical optimization
Data analysis, regression
Linear algebra
Financial economics

Foreign Languages

French (fluent), Spanish (basic), Mandarin (beginner)

Self-taught programming languages

C (Middle school)
C++ (High school)
PPC assembly (College)
PHP and MySQL, LAMP stack (College)

Self-taught basics of number theory and cryptography (College)

Free time: hiking, swimming, and mountaineering

Research and publications

Several peer-reviewed articles, patents, and other publications
See: https://www.bruguier.com/research.html