

Antoine J. Bruguier

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Education

California Institute of Technology

PhD, Electrical Engineering

October 2007

Thesis: Encoding of Financial Signals in the Human Brain

Advisor: Peter Bossaerts

California Institute of Technology

MS, Electrical Engineering, 4.0 GPA

June 2004

École Supérieure d'Ingénieurs en Électronique et Électrotechnique

Diplôme d'Ingénieur (MS in Electrical Engineering), valedictorian

June 2004

Skills

Relevant course work at the California Institute of Technology

Methods of applied mathematics	Random processes for communication and signal processing	Introduction to probability models with applications
Information theory	Wavelets and modern signal processing	Financial economics

Relevant course work at the École Supérieure d'Ingénieurs en Électronique et Électrotechnique

Advanced programming (C++)	Calculus and linear algebra 1 and 2	Computer algorithms and graph theory
Applied dynamic programming	Numerical computations and optimization	Probability and statistics
Common transforms in signal processing	Transforms and digital filters	Introduction to Management

List of programming languages

C, C++	C#, Objective C	Java, JavaScript
SQL	68k, PPC assembly	Matlab
PHP	OpenBSD	Unix scripts

Research Experience

California Institute of Technology

Graduate Research Assistant

2004-2007

- Data analysis of fMRI signals acquired during neuroeconomics experiments, by integrating new statistical and signal processing methods, such as
 - Canonical correlation analysis
 - Hotelling's T^2 tests
 - Other multivariate methods (PCA/ICA)
 - Ridge regression
 - Deconvolution
 - Generalized cross validation
 - Denoising with wavelets
- Testing validity of utility theory in the brain of subjects playing a simple gambling card game
- Aiming to discover how the human brain aggregates information from stock market trading orders

- Collaborating with Columbia university on encoding of risk aversion in the brain
- Testing human behavior among people with theory of mind deficit (Asperger's syndrome)
- Languages used: C++, Matlab, Unix scripts

École Supérieure d'Ingénieurs en Électronique et Électrotechnique

Undergraduate researcher Spring 2000

- Collaborated to devise cipher part of a fully featured encryption program (wrote ciphers)
- Implemented IDEA and 2048-bit RSA ciphers
- Languages used: C++, PowerPC assembly

Professional Experience

Philips Medical Systems North America

Summer Intern Summers 2002, 2003, and 2004

- Improved on automated EKG interpretation algorithms for cardiographs
- Created proprietary algorithm for measurement of QRS-T loops using vectorcardiography
- 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
- Wrote EKG marking program for the rest of the team
- Languages used: C++, C#, Basic, MATLAB, Unix scripts

OSC Solutions

Summer Intern Summer 2001

- Setup startup company's IT infrastructure (Setup LAN, Source Control Server)
- Utilized Java/WebObjects to create prototype for Enterprise Resource Planning program
- Finalized customer management and production logistic sections
- Utilized ReportMill to generate reporting files and bills
- Languages used: Java, SQL, Unix scripts

LSV Communication

Summer Intern Summer 1999

- Programmed a shopping cart for a real-estate advertisement website
- Developed a mailing-list database allowing customers to receive weekly and personalized updates
- Languages used: 4D, JavaScript

Teaching Experience

California Institute of Technology

Teacher's assistant 2003-2004

Classes: Random Processes for Communication and Signal Processing
Communication Theory (a) and (b)

Instructor: Payman Arabshahi

- Provided help to students for homework and hands-on project
- Graded homework sets and exams

References available at: <http://www.bruguier.com/references.html>