

# Matthew T. Harrison

## Curriculum Vitae

Department of Statistics  
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### Research Interests

**Statistics.** Conditional inference, Multiple hypothesis testing, Sequential importance sampling

**Neuroscience.** Pattern detection in multi-neuronal spiking data, Exploratory data analysis

**Information theory.** Rate distortion theory, Model selection

**Computer vision.** Structured statistical models, Natural scene statistics, Perceptual organization

### Academic Appointments

**Carnegie Mellon University** (September 2006 – present)

Visiting Assistant Professor, Department of Statistics

**Brown University** (June 2005 – July 2006)

Postdoctoral research associate, Division of Applied Mathematics

**Mathematical Sciences Research Institute** (January - May 2005)

Postdoctoral member, Program in Mathematical, Computational and Statistical Aspects of Vision

### Education

**Brown University**, Ph.D., Applied Mathematics (2005)

Thesis title: *Discovering compositional structures*

Thesis advisor: Stuart Geman

**Brown University**, Sc.M., Applied Mathematics (2000)

**University of Virginia**, B.A., Mathematics and Cognitive Science (1998)

### Fellowships and Awards

National Defense Science and Engineering Graduate Fellowship (1998-2001)

Howard Hughes Medical Institute Predoctoral Fellowship in Biological Sciences (1998)

Jefferson Scholarship, University of Virginia (1994-1998)

Phi Beta Kappa, University of Virginia (1997)

## Teaching Experience

Intermediate Statistics (graduate), Carnegie Mellon University (2007, 2008)

Probability Theory and Random Processes (undergraduate), Carnegie Mellon University (2007)

Engineering Statistics and Quality Control (undergraduate), Carnegie Mellon University (2006, 2008)

Mathematical Methods in the Brain Sciences<sup>1</sup> (mostly undergraduate), Brown University (2004, 2005)

11<sup>th</sup> grade algebra program, “The Met” High School<sup>2</sup>, Providence, RI (2005 – 2006)

Several TA experiences and numerous individual lectures in undergraduate and graduate mathematics and statistics courses.

## Professional Activities and Service

Member of ASA, IEEE, SIAM

Ad hoc reviewer for Electronic Journal of Statistics, Entropy, IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, Journal of Neurophysiology, Neural Computation, Neuron, PLoS Computational Biology, SIAM Journal on Imaging Sciences, CVPR (International Conference on Computer Vision and Pattern Recognition), ECCV (European Conference on Computer Vision), ISIT (IEEE International Symposium on Information Theory), ITW (IEEE Information Theory Workshop)

Presenter at the MSRI / MAA PREP (Professional Enhancement Program) Workshop on the Mathematics of Images, Berkeley, CA, March 2005 (for mathematics teachers who want to incorporate imaging science into their undergraduate courses)

Co-organizer of the weekly postdoctoral seminar, MSRI, Spring 2005

Organizer of the weekly Pattern Theory seminar, Brown University, 2003-2006

## Undergraduate mentoring

Nan Zhang, “Estimation of the rate-distortion function”, Spring 2007

Aaron DePonceau, “Multi-scale multiple hypothesis testing”, Summer 2008

Daniel Frank, “Jitter-corrected cross-correlograms”, Summer 2008

(Publications are listed in a separate document.)

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<sup>1</sup> Mathematical Methods in the Brain Sciences targets students in the brain sciences (psychology, neuroscience, etc) with only a calculus background. It introduces topics in differential equations, probability & statistics, information theory, and mathematical programming (MATLAB).

<sup>2</sup> The Met (Metropolitan Regional Career and Technical Center) is an experimental, progressive, inner-city high school where students learn through community internships. It is successful in most areas, but not mathematics education. I designed and taught a remedial algebra class that better adhered to their educational philosophy.