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Amrita Mazumdar

Education

Expected Spring 2014 — **B.S., Computer Engineering**, *Columbia University*, New York, NY.
Research Interests: Computer architecture, embedded system design, visual computing processors.
Minor: English & Comparative Literature.

Experience

Research

2013 — **DREU Research Fellow**, Computer Engineering Department, Brown University.
Laboratory for Engineering Man/Machine Systems, R. Iris Bahar
Sub-threshold circuit design, electronic design automation. Developed an automated synthesis tool for generating noise-immune sub-threshold circuits using custom Schmitt trigger logic. Funded by a Distributed Research for Undergraduates grant from the Computing Research Association (CRA-W) and the Coalition to Diversity Computing (CDC). Presented at Brown Undergraduate Research Symposium. Prepared paper for submission to conference.

2011-2012 — **Research Assistant**, Computer Science Department, Columbia University.
Columbia Automated Vision Environment, Shree Nayar
Schlieren optics, SNR analysis. Designed and constructed a Schlieren optics system for visualizing transparent media. Gathered signal-noise ratio data for Point Grey and Lumenera camera sensors, to be used in performance analysis for computational imaging applications.

2008-2011 — **Independent Researcher**, Lincroft, NJ.
High Technology High School, Michael T. Roche
Schlieren optics. Designed and implemented a Schlieren optics and shadowgraphy system in the High Technology High School research facility. Funded by Young Science Achievers Program grant. Presented at the University of Pennsylvania NANO/BIO Interface Center. First place at the Jersey Shore and Delaware Valley science fairs. Recipient of the Inasco Haines/NASA Award.

Work

2012 — **ASIC Design Intern**, *IBM Microelectronics*, Burlington, VT.
VLSI circuit design & analysis. Designed a third-generation array of ring oscillators for hardware disposition in future products. Process included design, implementation, layout, physical and logical checking, simulation, and validation of the circuit.

Teaching

2011 - Present **Seminar Instructor**, *Emerging Scholars Program in Computer Science*, Columbia University.
Led special seminars for top students in Columbia's introductory computer science course (COMS 1004). Sample topics include natural language processing, graph theory, speech recognition, encryption, and complexity theory.

2012 - Present **Laboratory Assistant**, *Columbia Science Honors Program*, Columbia University.
Laboratory assistant for the Columbia Science Honors Program course on Programming in Java. Worked weekly with 30-60 high schools students on programming techniques. Topics include computer science fundamentals, algorithmic problem-solving, and introductory Java programming in UNIX.

2012 **Teaching Assistant**, *Computer Science Department*, Columbia University.
Teaching assistant for COMS 1007 - Object Oriented Programming and Design in Java, a required advanced Java programming course. Held weekly office hours, graded problem sets and exams, and taught recitations for a group of 100-150 undergraduates. Topics include object-oriented design principles, basic GUI construction, networking, multithreading, and databases.

2010 - 2012 **Volunteer Tutor**, *Math Mentors*, MS 324 Patria Mirabal School, New York, NY.
Taught review sessions and conducted one-on-one tutoring for 6th-8th grade algebra and trigonometry in preparation for the New York Regents exams.

Publications

M. Donato, A. Mazumdar, R. I. Bahar, J. Mundy, W. R. Patterson, and A. Zaslavsky. An automatic synthesis tool for improving noise-immunity in sub threshold circuits using schmitt-trigger reinforcement gates. *Submitted*, 2013.

A. Mazumdar. Principles and techniques of schlieren imaging systems. Technical Report CUCS-016-13, Department of Computer Science, Columbia University, New York, NY, July 2011.

Languages & Skills

Software Java, C, C++, Python, MATLAB, PHP/MySQL

Hardware VHDL, Verilog, SPICE

CAD Cadence, Autodesk Inventor & Maya, X-code/G-code for CNC milling

Publishing LaTeX, Adobe InDesign, Photoshop, Illustrator, Acrobat

Human English, Bengali, Hindi, French

Leadership & Activities

2013-2014 **Columbia Women in Computer Science**, *Vice President of Social Affairs*.

2012-2013 **Columbia Women in Computer Science**, *General Event Coordinator*.

2011-2012 **Columbia Daily Spectator**, *Deputy Editor for Digital Infrastructure.*
2010-2011 **Columbia Daily Spectator**, *Daily Blog Editor.*

Coursework

Fall 2013

Operating Systems, *Junfeng Yang.*
Computational Imaging, *Shree Nayar.*
Computer Graphics, *Eitan Grinspun.*
Revolutions in Text & Technology, *Susan Mendelsohn.*

Spring 2013

Embedded System Design, *Steven Edwards.*
3D User Interfaces & Augmented Reality, *Steven Feiner.*
Electronic Circuits, *David Vallancourt.*
Computer Science Theory, *Seung Geol Choi.*

Fall 2012

Advanced Logic Design, *Steven Nowick.*
Computer Graphics, *Michael Reed.*
Digital Signal Processing, *Daniel Ellis.*
Circuit Analysis, *Charles Zukowski.*
Probability, *Mariana Olvera-Cravioto.*

Spring 2012

Data Structures & Algorithm Analysis, *Peter Allen.*
Digital Systems, *Ken Shepard.*
Ordinary Differential Equations & Linear Algebra, *Marc Spiegelman.*
Physics Lab, *Aaron Veicht.*
Principles of Economics, *Sunil Gulati.*
Literary Texts & Critical Methods, *Erik Gray.*

Fall 2011

Signals & Systems, *Xiaodong Wang.*
Fundamentals of Computer Systems, *Stephen Edwards.*
Discrete Mathematics, *Jonathan Gross.*
Advanced Programming, *Jae Woo Lee.*
Major Texts of East Asia, *Hikari Hori.*

Spring 2011

Object-Oriented Programming & Design, *Josh Gordon.*
Physics II, *Emlyn Hughes.*
Calculus IV, *Valentino Tossatti.*
Gateway Fundamentals of Engineering, *Promiti Dutta.*
Major Texts of the Middle East & India, *Annabella Pitkin.*

Music Humanities, *Ashley Nail*.

Fall 2010

Introduction to Electrical Engineering, *David Vallancourt*.

Introduction to Java, *Adam Cannon*.

Physics I, *Jeremy Dodd*.

Calculus III, *Sabin Cautis*.

General Chemistry I, *James Valentini*.

University Writing, *Diane Cook*.