
BRENDAN A. DUNCAN

SUMMARY	Engineering Master's student seeking research position in computer vision, graphics, or machine learning. Proven collaborative skills. Thorough, organized, and scientific, with an enthusiasm for innovation.
EDUCATION	MS in Computer Science, Stanford University expected 6/2011 <ul style="list-style-type: none">• GPA 3.85. BS in Computer Science, University of California, San Diego 6/2009 <ul style="list-style-type: none">• Degree awarded <i>summa cum laude</i>. GPA 3.90.• Phi Beta Kappa and Tau Beta Pi honor societies.
SKILLS	C++, C, Java, MATLAB, MEX, OpenGL, OpenCV, WinAPI, CUDA, OpenGL Shading Language, Perl, PHP, Python, SQL, OCaml, Bash, HTML, \LaTeX , Verilog, MIPS, SPARC, JDBC, COM. VIM, Microsoft Visual Studio, Photoshop, Perforce, Eclipse, Xilinx ISE, Microsoft Excel.
COURSE TOPICS	Computational photography, computer vision, graphics, machine learning, applied vision and image systems, object-oriented programming, software design, computer architecture, logical circuit design, networks, operating systems, compiler design, databases, efficiency, computability. Numerical analysis, vector calculus, differential equations, linear algebra, discrete mathematics.
EXPERIENCE	Course Assistant for Graphics, Stanford University, Stanford, CA 9/2010 - 12/2010 <ul style="list-style-type: none">• Created and graded GUI and HDR photography programming assignments, guided students in the use of C++ and OpenGL, and graded exams. Research Intern, Intuitive Surgical, Sunnyvale, CA 6/2010 - 9/2010 <ul style="list-style-type: none">• Used CUDA to efficiently process videos obtained using a novel capture method. Several different real-time processing algorithms were used.• Demonstrated processed live video in a laboratory in front of surgeons and researchers. Tutor for Data Structures, UCSD, San Diego, CA 4/2007 - 6/2009 <ul style="list-style-type: none">• As head tutor, responsibilities included releasing and grading assignments, working on course webpage, responding to tutor and student questions, and collaborating with professor to improve course structure and assignments.• Assisted students individually and in groups, guided students in the use of UNIX programming tools to identify and resolve programming errors, guided students on approaches to problem solving, graded programming assignments and exams. Interim Engineering Intern, Qualcomm, San Diego, CA 6/2008 - 11/2008 <ul style="list-style-type: none">• Developed a Windows application allowing testers to design, modify, and run automated PHP test scripts that interfaced with the team's cell phone application. Used C++, Microsoft Visual Studio, and COM objects. Created extensive documentation and trained testers in the use of this application.• Created Perl and PHP scripts using Perforce commands to automate weekly application release. Programmer, Global CONNECT, San Diego, CA Summer 2007 and 2009 <ul style="list-style-type: none">• Using Perl and Bash scripts in a Cygwin environment, implemented sorting and search algorithms to efficiently collect, filter, and examine large amounts of data.• Used regular expressions to extract data sought by research team of economists and statisticians.
COURSE PROJECTS	Computational Photography <ul style="list-style-type: none">• Aligned successive images on foreground and background objects using SIFT and RANSAC. Used adaptive averaging to create a low-noise result while preventing ghosting.

- Designed and implemented on a programmable camera an efficient contrast detection autofocus algorithm using golden section search.

Graphics

- Created hierarchical model animations, a UI using OpenGL, and image filters using GLSL.
- Implemented wavelet compression, subdivision surfaces, and matte extraction.

Machine Learning

- Created spam classifiers using a naive Bayes model and support vector machines.
- Implemented linear regression and locally weighted regression.
- Implemented an efficient k-means clustering algorithm to reduce the number of colors in an image.
- Implemented independent component analysis and reinforcement learning in MATLAB.

Computer Architecture Lab

- Devised a customized ISA specifically optimized to solve assigned problems. Used Xilinx ISE and Verilog to create a working, pipelined CPU for this architecture.

Object-Oriented Programming from a Modeling and Simulation Perspective

- Designed and implemented in C++ a shipping network simulation using multiple shipment routing algorithms, notifications, and real- and virtual-time events.

Compiler Construction

- Implemented semantic checks and SPARC code generation for a C-like language with struct member functions, function overloading, and run-time checks for array out-of-bounds and null pointer dereference.