

David C. Liu
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Objective

Seeking a summer internship to apply my software development skills to an exciting project.

Skill Set

- 12 years experience programming
 - Extensive working experience with Perl, Java, C/C++, JavaScript, Microsoft Visual Basic
 - Knowledgeable in software design patterns and object oriented programming
- Web application development: Catalyst (Perl MVC framework), jQuery, AJAX
- MySQL, SQLite database design & applications
- Embedded systems programming: VxWorks, PIC, Arduino (Atmel)
- OpenCV (computer vision), Marsyas (audio analysis), Prefuse (Java visualization library), OpenGL, OpenAL (3D audio library)
- Development tools: Eclipse, CMake, Vim, GNU/GCC toolchain, Subversion
- Linux administration – Ubuntu, Debian, CentOS/RHEL 5
- Graphic design tools: Inkscape, Photoshop, InDesign, After Effects

Work and Research Experience

NASA Ames Research Center, Intelligent Robotics Group

Paid Computer Vision Research Intern, February 2010 – present; June – August 2008

Researched computer vision analyses for Microscopic Imager data from Mars Exploration Rovers and aerial images for oil pipeline monitoring. (NASA Vision Workbench, OpenCV vision library, C++, Perl)

Research Science Institute at MIT, Summer 2009

Highly selective summer program for students interested in research. Worked with the Spoken Language Systems Group, MIT CS/AI Lab, on a speech recognition Web service. Developed a method to automatically adapt the system's acoustic models, enabling domain-specific speech recognition. (Java, C++, Bash scripting)

Freelance Programmer, DCLsoft.com, 2003 – 2007

Developed numerous projects for clients, including:

- Schedz.com: web-based schedule publishing system targeted at radio stations. (Perl, MySQL, JavaScript)
- Link Restrictor: web-based reciprocal link checker and admin interface. (Perl, MySQL, JavaScript)
- TradersNation ProXstream: branded desktop media player for playing scheduled streaming audio programs. (Visual Basic)
- Donor Buddy: desktop finance tracking/data entry management application (Visual Basic)
- File Grabber: branded FTP client (Visual Basic)

Future Business Leaders of America, Internet Application Development competition, 2008

Developed a Web-based grade book system, and won state champion and 2nd place nationally. (Perl, Catalyst MVC framework, DBIx::Class Object-Relational Mapping, jQuery, AJAX.)

FINALE, final project in AP Computer Science class, 2008

Led a team of 3 in designing and developing a computer game with extensive graphics. Complete software development process from initial idea, to design, architecture, implementation, and testing. Extensive use of design patterns. (Java)

Independent research (See also Awards and Honors)

2009 – 2010: Semantic Image Retrieval and Interactive Exploration of Large Image Collections

Developed a system that dramatically improves image retrieval by linking low-level features to high-level semantic concepts; e.g. “buildings” and “trees.” Created an interactive image browser (*patent pending*) that reveals the underlying structure of large collections, to an extent not possible with past approaches. Applied my research to detect threats to buried oil pipeline, by automatically flagging digging equipment in aerial imagery. (OpenCV vision library, C++, Java, Perl.)

2007 – 2008: Content-Based Image Retrieval (“Where’s That Image?”)

Developed an algorithm to improve image retrieval accuracy by integrating color and texture features with a machine learning model. Developed a feature visualization tool and framework for image retrieval research. (OpenCV vision library, C++, Java, Perl.)

2006 – 2007: Acoustic Music Similarity Analysis (“A Smarter Music Search.”)

Explored algorithms for audio analysis and music retrieval, using techniques from spectral graph theory. Developed a 3D representation and navigation system for browsing music based on content similarity. (Marsyas music analysis library, C++, Perl, OpenGL, OpenAL.)

Lynbrook Robotics Team, August 2006 – present

2009-2010 Co-President, 2008-2009 VP of Engineering, 2007-2008 Chief Software

Lead software developer since joining the team. Knowledgeable about DC motor control, feedback systems, pneumatics, various sensors.

2009 – present: Programmed the VxWorks-based CompactRIO from National Instruments, using C++.

Designed software architecture of robot software, led team of 7.

2006 – 2008: Programmed the PIC-based Innovation First robot controllers, in C. The autonomous code that I developed has won awards at competition (Rockwell Automation Innovation in Control Award).

Awards and Honors

- Intel Science Talent Search Finalist
- Siemens Competition in Math, Science & Technology – Regional Finalist
- Intel International Science and Engineering Fair 2007, 2008, 2009
 - 3rd & 4th place in Computer Science
 - IEEE Computer Society: 1st award
 - Awards from U.S. Army and Office of Naval Research
 - Association for the Advancement of Artificial Intelligence: 1st and 2nd place award
 - Association for Computing Machinery: Honorable Mention
 - Intel Excellence in Computer Science Award
- California State Science Fair 2005-2009 – 1st, 2nd, 3rd place and Honorable Mention
- Synopsys Silicon Valley Sci. & Tech. Championship 2004-2009 – Grand Award (Best of Fair) 4 times
- Future Business Leaders of America 2008-2009:
 - National 2nd and State Champion in Internet Application Design
 - State Champion in Cyber Security

Education

- Lynbrook High School, San Jose, California, Class of 2010 GPA: 4.00/4.00
- Admitted to Stanford University, Class of 2014 via Early Action