Curran Daniel Muhlberger

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Objective

To apply my scientific experience and programming abilities to solve unique and challenging problems in aerospace, large-scale computing, scientific research, or national security.

Technical interests

high-performance computing · scalable software architecture · Bayesian inference · signal processing · cryptology & security · numerical modeling

Work experience

- **Cornell University: Center for Radiophysics and Space Research** . . . . . Ithaca, NY
  Graduate research assistant: 2009–present
  - Conducted independent research on fluid and magnetic instabilities in stars using numerical simulations (presented to the American Physical Society in April 2013; paper in preparation)
  - Collaboratively developed and tested components for high-performance parallel scientific code (C++)
  - Refactored and optimized existing code and facilitated deployment to new supercomputing environments
  - Implemented spectral and finite-volume methods to solve Einstein's equations coupled with MHD
  - Performed 3D data visualization in ParaView and developed new visualization pipelines
  - Developed web-based diagnostic tools for simulations using Scala and Play

  Graduate teaching assistant: 2008–2012
  - Instructed technical and non-technical college students in mechanical, electrical, and celestial physics
- **NASA Marshall Space Flight Center** . . . . . Huntsville, AL
  NASA Academy research associate: June –August 2008
  - Developed software tools to evaluate on-orbit performance of the GLAST Burst Monitor (C, Java, Perl)
  - Supported scientists and mission operators during instrument checkout
- [redacted]
- **UMD Institute for Advanced Computer Studies** . . . . . College Park, MD
  Technical staff: June 2006 – May 2007
  - Developed J2EE web applications to interact with an LDAP infrastructure
  - Migrated and maintained existing J2EE web applications and MySQL databases
  - Assisted in maintaining HPC Linux clusters running MPI and Condor
  - Assisted in system administration for over 700 UNIX and Linux hosts
  - Provided technical support to scientific researchers
- **NASA Goddard Space Flight Center** . . . . . Greenbelt, MD
  College Freshman Intern Program: June 2005
  - Served as project manager for a team of six to develop a mock lunar mission
  - Prototyped orbit and communications subsystems for a mock lunar mission
- **UMD Space Physics Group** . . . . . College Park, MD
  Student programmer: January–May 2005
  - Developed a program in IDL to identify upstream events in satellite data
  - Developed a program in Java to extract and format unstructured data from the Internet

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Work experience (continued)

- [redacted]

Education

- **Cornell University** . . . . . Ithaca, NY
  Doctor of Philosophy in physics (expected May 2014)
  Master of Science in physics (December 2011)
  - GPA: 3.905 [44 credits]
- **University of Maryland, College Park** . . . . . College Park, MD
  Bachelors of Science in physics, mathematics, and astronomy (May 2008)
  - GPA: 3.978 (*magna cum laude*) [206 credits]
  - Graduated with High Honors in physics and astronomy
- **Massive open online courses**
  - *Artificial intelligence for robotics (in-progress)* . . . . . Udacity
  - *Functional programming principles in Scala (2013)* . . . . . Coursera
  - *Introduction to parallel programming (2013)* . . . . . Udacity

Technical skills

- **Operating system administration**
  - Linux (Ubuntu, RHEL)
  - UNIX (Solaris)
- **Computer languages**
  - Proficient in: Scala · Java · C++ · C · HTML5 · CSS
  - Familiar with: CUDA · SQL · Python · Perl · PHP · x86 assembly
- **Software libraries and frameworks**
  - Akka · MPI · OpenMP · BLAS/LAPACK · GSL · FFTW · Thrust · Play Framework · JFC/Swing · Bootstrap 3
- **Software development tools**
  - VCS: Git · Mercurial · Subversion
  - IDE/Editor: Netbeans · Eclipse · Vim
  - C/C++ compilers: GCC · Clang · Open64 · Intel · Solaris Studio
  - Other: SBT · GDB · Doxygen · Trac
- **Technical and professional applications**
  - Mathematica · MATLAB · R · ParaView · Gnuplot · IDA Pro · STK · Apache httpd · MySQL · Adobe Creative Cloud · Microsoft Office

Volunteering and leadership

- Website and photography chair for Cornell's Expanding Your Horizons workshop (2012–present)
- Member of Cornell's Student Library Advisory Council (2010–present)
- Renovated Cornell's Physics Educational Computing Facility (2010–2011)
- Database and web developer for Lights Off Cornell (2010)
- Vice President of Communications of Cornell's Physics Graduate Society (2009–2011)
- Webmaster for the Terrapin Astronomical Society (2004–2008)
- Web developer for The Astronomy Workshop (2007)
- Judge for Howard County Mathematics, Science, and Technology Fair (2005)
- Senior analytical manager of SAFE H_2O (2002–2004)

Awards and achievements

- AAPT Outstanding Teaching Assistant (2009)
- 2nd place in science, MSFC poster contest (2008)
- CMPS Outstanding Undergraduate in the College (2008)
- Student speaker at CMPS graduation ceremony (2008)
- Senior Marshal for UMD commencement ceremony (2008)
- Phi Beta Kappa honor society, junior inductee (2007)
- Banneker/Key Scholar, UMD (2004–2008)
- National Outstanding Team, COMAP High School Mathematical Contest in Modeling (2002)