Akshay Kulkarni
Software Development Engineer in Test, Microsoft

Redmond, WA - Email me on Indeed: <u>indeed.com/r/Akshay-Kulkarni/80487c19043498f6</u>

• 2 years of experience in automated software testing of cloud services and big data analysis at Microsoft

• 7 years of full-time research experience at Harvard and Cornell, designing and running massively parallel astrophysical simulations, analyzing large datasets

• Versatile set of programming and system administration skills

• Ability to work on multiple projects simultaneously and see them to completion

Interested in solving challenging problems using these skills. To solve interesting and challenging problems using my strong analytical and computer skills. Strong background in automated software testing, cloud services, big data analysis, object-oriented programming, scientific programming, high-performance computing.

WORK EXPERIENCE

Software Development Engineer in Test
Microsoft - Redmond, WA - February 2012 to Present

Responsibilities
Helped run Microsoft Account, a large-scale cloud identity service that handles billions of authentications per day and is the gateway into all of Microsoft's consumer offerings.

• Performed big data analysis of user telemetry from Microsoft Account, in order to detect and prevent bad user activity, gain insights into how customers were using our service, and validate that our service was functioning properly.

• Owned automated testing of a machine learning-based system to detect suspicious user behavior.

• Drove the testing and troubleshooting of verification code delivery to customers' phones.

• Collaborated with a third-party company and international test teams spread across multiple time zones.

• Contributed to library development (C#) for automated testing.

• Investigated production issues/bugs in the service, often working directly with the customer.

• Provided critical feedback during the software design phase.

Postdoctoral Research Associate
Harvard University - Cambridge, MA - January 2010 to Present

• Modeled gas flows around black holes using massively parallel supercomputer simulations.

• Performed code scaling tests and determined the optimal grid resource utilization strategy on a range of cluster architectures.

• Developed a ray-tracing code (C, parallelized with OpenMP) to produce images of the simulation results.

• Wrote Perl, Python and Bash scripts to automate the download, analysis, visualization and backup of the simulation results.

Graduate Research Assistant
Cornell University   -   Ithaca, NY   -   August 2003 to December 2009

• Designed and carried out the first ever large-scale simulations of plasma instabilities around magnetized stars.

• Participated in code optimization.

• Wrote an input/output module to enable the code to collect data from its parallel sub-processes and write it serially to disk, and vice versa, making the data vastly easier to handle.

• Wrote programs to perform time series analysis of the brightness variations of the simulated stars.

• Set up a stereoscopic visualization/animation system for the simulations, involving seamless integration of Perl, Python, Bash and Tecplot scripts, completely transparent to the user. Also developed a technique to make dual-projector stereoscopic presentations using HTML/JavaScript/CSS. These became very effective in promoting the group's research at scientific conferences.

Teaching Assistant
Cornell University   -   Ithaca, NY   -   August 2004 to May 2005

Led tutorial sections for two introductory astronomy courses.

Graduate Fellow
Cornell University   -   Ithaca, NY   -   August 2003 to August 2004

EDUCATION

Ph.D. in Astronomy
Cornell University   -   Ithaca, NY
January 2003 to January 2009

M.S. in Astronomy
Cornell University   -   Ithaca, NY
January 2003 to January 2007

B.Tech. in Engineering Physics
Indian Institute of Technology   -   Mumbai, Maharashtra
January 1999 to January 2003

SKILLS

Big data analysis, cloud services, automated testing, scientific research, high-performance computing, parallel programming, scientific visualization, stereoscopic (3D) visualization, system administration,

troubleshooting, communication skills, academic writing, data analysis with large data sets, analytical skills, critical thinking skills, multi-tasking ability, team player. Languages: C, Fortran, Python, Perl, Bash, LaTeX, HTML, JavaScript, CSS. Platforms: GNU/Linux (various distributions), Windows (98, 2000, XP), MS-DOS. High-performance computing (HPC) systems: various NASA and TeraGrid clusters. HPC/scientific software: MPI, OpenMP, GNU Scientific Library (GSL), MINPACK. Visualization software: Tecplot, Python (matplotlib), gnuplot. Computational fluid dynamics (CFD): mesh-based finite-volume Godunov-type codes. Time series analysis. Other: Intel and GNU compilers, rsync, LVM, Samba, Git, Subversion, GNU make; some experience in GUI development.

LINKS

http://www.linkedin.com/in/akkulkarni

AWARDS

Vacation Students Programme Summer Fellowship, Inter-University Centre for Astronomy and Astrophysics, Pune, India, 2002
June 2002

Graduate Fellowship, Cornell University Graduate School, 2003-2004

Graduate Research Assistant (funded by NASA and NSF), Cornell University, 2005-2009

IAU Grant and Cornell University Graduate School Conference Grant for contributed talk at IAU Symposium 243, Grenoble, France, 2007
May 2007

AAS International Travel Grant and Cornell University Graduate School Conference Grant for contributed talk at AMXP 2008
June 2008

PUBLICATIONS

2D and 3D MHD Simulations of Disk Accretion by Rotating Magnetized Stars: Search for Variability
2006

Torsional Magnetic Oscillations in Type I X-Ray Bursts
2007

Unstable Disk Accretion onto Magnetized Stars: First Global Three-Dimensional Magnetohydrodynamic Simulations
2008

Discovery of Drifting High-Frequency Quasi-Periodic Oscillations in Global Simulations of Magnetic Boundary Layers
2009

QPO Emission from Moving Hot Spots on the Surface of Neutron Stars: A Model
2010

Global 3D Simulations of Disc Accretion on to the Classical T Tauri Star V2129 Oph

2011

Global 3D Simulations of Disc Accretion on to the Classical T Tauri Star BP Tauri
2011

Variability Profiles of Millisecond X-Ray Pulsars: Results of Pseudo-Newtonian Three-Dimensional Magnetohydrodynamic Simulations
2005

Accretion to Magnetized Stars through the Rayleigh-Taylor Instability: Global Three-Dimensional Simulations
2008

Possible Quasi-Periodic Oscillations from Unstable Accretion: 3D MHD Simulations
2009

Measuring Black Hole Spin by the Continuum-Fitting Method: Effect of Deviations from the Novikov-Thorne Disc Model
2011

ADDITIONAL INFORMATION

• As a hobby during undergraduate years, developed a full-fledged software program to draw two- and three-dimensional graphs of arbitrary user-supplied mathematical functions. The program included an equation parser, and its GUI interface, built in Visual Basic, supported standard operations such as translating and zooming the view.
• 11 publications (4 with lead authorship) in peer-reviewed journals.
• Recipient of grants from the American Astronomical Society and Cornell University for conference presentations.
• Teaching Assistant for two introductory astronomy courses at Cornell University. Also involved with some outreach work.
• Foreign languages: Russian (competent), Hindi and Marathi (native).