# Amlesh Kashyap

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## Education

2015 **National Institute of Technology**, *Patna, Bihar, Bachelors of Technology in Computer Science and Engineering - CGPA: 7.77/10.*

2011 **DAV Public School**, *Khagaul, Patna, Bihar, (Central Board of Secondary Education), Class XII - Percentage: 87.6.*

2009 **DAV Public School**, *Khagaul, Patna, Bihar, (Central Board of Secondary Education), Class X - Percentage: 94.8.*

## Experience

Jun,2015–Present **Research/Project Assistant**, *Indian Institute of Science*, Bangalore, Karnataka, Member of Middleware and Runtime Systems Lab, Under the guidance of Dr Sathish Vadhiyar (Also a member of Intel Parallel Computing Center).

Jun,2016–Jun,2016 **Summer Student**, *Microsoft Research*, Bangalore, Karnataka, Summer School on Internet of Things, in collaboration with Indian Institute of Science.

May,2014–Jul,2014 **Summer Intern**, *Indian Institute of Science*, Bangalore, Karnataka, Member of Multiphase Flow Simulation Lab, Under the guidance of Dr Gaurav Tomar.

## Projects

Oct, 2016 - Present **Research and Development of G-Charm - An Adaptive Runtime System for Message-Driven Parallel Applications on Hybrid Systems.**, (Dr Sathish Vadhiyar).
Currently working upon modifying the original research prototype into working software.
*Code in Charm++, CUDA. Compilers*

April, 2016 - Present **Hybrid Executions of the physics routines in CAM5 - Evaluating asynchronous executions, proportional partitioning and pipeline executions.**, (Dr Sathish Vadhiyar, Dr Ravi Nanjundiah).
Ported major portions of the convection and radiation routines (in both CAM4 and CAM5), including deep convection, shortwave and longwave radiations to Intel Xeon Phi. Exploring hybrid models of execution using Knights Corner.
Manuscript in Preparation
*Code in Fortran. Asynchronous Offload, Compiler Flags, Proportional Partitioning*

Jun, 2015 - Jul 2016 **Asynchronous and Sychronous Models of Execution for High Performance of Long-wave Radiation Routine in Community Earth System Model**, (Dr Sathish Vadhiyar, Dr Ravi Nanjundiah).
Worked with the longwave radiation routine Radabs, a component of the physics routines in the Atmosphere component CAM of the Community Earth System Model (CESM). Explored hybrid synchronous and asynchronous models of execution using Intel Xeon Phi Accelerators (KNC)
Manuscript in review, in *Journal Of Parallel and Distributed Computing*
*Code in Fortran. Asynchronous Offload, Vectorization, Compiler Flags, Approximation Theory, Design Modification*

July, 2016 **Simulation of Shor's Algorithm on LiQUiD**, (Independent Project).
Working towards simulating Shor's algorithm on LiQUiD, the quantum computing simulator by Microsoft. As a course project for the online course on Quantum Mechanics and Quantum Computation (edX) by Umesh Vazirani.

Jun, 2016 **Smart Transportation - Detecting Various Events While Driving**, (Hackathon during Summer School on IoT).
Used accelerometer to detect sharp brakes and turns during driving, and automatically start the video recording and publish the event. Also, visualized the speed during the complete trip. Deployed on a real car.
*Languages - Java (Backend), Python (event detection), Plotly (Visualization), Shell Scripting. Accelerometers, Raspberry Pi, Microsoft Azure, MQTT*

Feb, 2016 **Image and Video Blurring On CPU and GPU**, (Independent Project).
Wrote an application for Gaussian and Median Blurring of images and videos on CPU and GPU, to demonstrate the speed difference.
*Written in C++ in MS Visual Studio. Used OpenCV.*

Feb,2015 - May,2015 **Encrypted File Transfer**, (Dr Akshay Deepak).
Created an application to ensure confidentiality of data over an ad-hoc network.
*Application created in Java as Major Undergraduate Project. Used AES and Diffie-Hellman Key Exchange.*

Sep,2014 - Dec,2014 **Mood Based Music Player**, (Prof A.S. Tewari).
Created an application to predict the mood of user based on their smartphone usage data. Wrote a music player to play songs according to the predicted mood.
*Application created in Android as Minor Undergraduate Project. Used K-Means clustering algorithm for prediction.*

May,2014 - Jul,2014 **Heat Equation Solver and its Parallelization**, (Dr Gaurav Tomar).
Created a solver for second order heat equation, using Conjugate Gradient, Gauss-Seidel and Successive Over Relaxation methods. Parallelized the Conjugate Gradient Version and did benchmarking for the cluster.
*Used C and MPI. Implemented CSR storage for pentadiagonal matrix. Project done during summer internship.*

Jun,2013 **ATM Simulator**, (Daneyal Lari).
Created a simulation of an ATM with features similar to real-world ATM machine.
*Application created using Java during summer training at Hewlett-Packard Education Services. Used JDBC for database connectivity.*

## Skills

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| Languages | C/C++, Fortran, Java, Python, MPI, OpenMP, CUDA, R, Javascript, HTML, Charm++, CSS |
| Databases | MySQL, Oracle |
| Script | Bash |
| Mobile | Android |
| Tools | Eclipse, Git, Netbeans, GNU Octave, GNU Plot, GNU Visit, HPC Toolkit, Intel VTune Amplifier, Microsoft Visual Studio, OpenCV, Vim, LiQUiD, Plotly |
| Typesetting | LaTeX |
| Coursework | Design and Analysis of Algorithms, Data Structures, Formal Languages and Automata Theory, Database Systems, Operating Systems, Software Engineering, Discrete Mathematical Structures and Graph Theory, Pattern Recognition, Machine Learning (Coursera), Automata (Coursera), Algorithms 1 (Coursera), Cryptography 1 (Coursera), Parallel Computing (Audited at IISc), Quantum Mechanics and Quantum Computation (edX) |

## Extra Curricular

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| GRE | Quant - 169, Verbal - 159 |
| Open Day | Demonstrated a simulation of the Mandelbrot set using single and 32 threads on CPU. Part of Open Day 2016 at Indian Institute of Science |
| Brown Belt | Brown Belt Developer Status on Intel Developer Zone |
| RMO | Qualified the Regional Mathematical Olympiad conducted by Homi Bhabha Centre for Science Education in 2010. |
| Indian Bansuri | Completed a Junior Diploma in Classical Music on Flute from Prayag Sangeet Samiti, Allahabad. Senior Member of Music Club at my college. |
| Corona 2013 | Member of Resource and Planning team during the annual technical festival of my college, Corona in 2013. |