

KANIKA SOOD

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EDUCATION

University of Oregon, Oregon, USA June 2018 (Expected)
PhD, Computer and Information Science GPA 3.77 (Scale of 4)
Advisor: Boyana Norris

University of Oregon, Oregon, USA Sep 2012 -Jun 2014
M.S. Computer and Information Science GPA 3.70 (Scale of 4)

Mody Institute of Technology & Science, Rajasthan, India Aug 2007- May 2011
B.Tech, Computer Science GPA 8.23 (Scale of 10)

TECHNICAL SKILLS

Languages: Python, C, C++, Java, MySQL
Tools: Eclipse, Netbeans, Coq

Web Technologies: HTML, XML, JavaScript, PHP
Databases: MySQL, DBVisualizer, DB2, phpMyAdmin

PROFESSIONAL EXPERIENCE

- **Schlumberger**, *REMS Intern, Software Technology Innovation Center* Jun 2016- Sep 2016
 - **University of Oregon**, *Research Assistant, High Performance Computation Lab* Sep 2014- Present
 - **University of Oregon**, *Instructor, Computer & Information Science* Jun 2014- Sep 2014
Course: Fluency with Information Technology (CIS 110)
 - **University of Oregon**, *Teaching Assistant* Sep 2012- Jun 2014
 - **CIS 211: Object Oriented Programming** Spring, Winter 2014
 - **CIS 122: Intro to Programming and Problem Solving** Fall 2013
 - **CIS 110: Fluency with Information Technology** Spring 2013
 - **CIS 210: Python Programming** Fall & Winter 2013
 - **SPICE**, *Volunteer* Jan 2017 -Present
Conduct workshops in Maple Elementary School to introduce Science.
 - **Thinkersmith**, *Volunteer* Nov 2013- Present
Introduce Computer Science to Elementary, High School students.
 - **WICS, University of Oregon**, *Volunteer* Dec 2013- Present
Introduce Computer Science to Elementary, High School students.
 - **IIT Delhi**, India, *Intern* Jul 2013- Sep 2013
Worked with Dr. S.K. Gupta (Professor) on Constraint Database problems.
 - **IBM**, India, *Associate Systems Engineer* Jun 2011- Aug 2012
Project: Digital Media Exchange (DMX), **Client:** Bharti Airtel, **Vendor:** Cinedigm
Translated business functionalities into technical solutions and worked with vendor and portal developers for technical implementation. Partnered with Bharti sales teams for product demonstrations to Bharti's prospective customers. Closely worked with vendor for enhancements needed in the product for successful integration of cinema product with external applications in DMX umbrella. Took lead in explaining vendors the needs of strong policies and process in Bharti environment.
 - **NTPC Ltd.**, India, *Intern* May 2010- Jul 2010
Survey of the company, thermal power plant along with the website creation for the organization.
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PUBLICATIONS

- *Solver Schemes for Linear Systems*, Comprehensive Exam Position Paper, Dec 2016.
- *Performance-based numerical solver selection in the Lighthouse framework*. SIAM Journal on Scientific Computing, Mar 2016.
- *Lighthouse: An automated solver selection tool*. Software Engineering for High Performance Computing in Computational Science and Engineering (SEHPCCSE), Nov 2015.
- *Lighthouse: A taxonomy-based solver selection tool*. Proceedings of the Second Workshop on Software Engineering for Parallel Systems (SEPS), Oct 2015.

- *Automated Selection of Numerical Solvers*. Technical Report, University of Oregon, Oct 2015.

PROJECTS

- **Comparative Performance Modeling of Parallel Krylov Methods** Feb 2017 - Present
Comparing the scalability of parallel Krylov methods given different input properties without requiring extensive empirical measurements. We consider the PETSc implementations of Newton-Krylov methods to produce scalability rankings based on our new comparative modeling approach. The model-based ranking is validated by comparison with empirical scalability results on a numerical simulation of driven fluid flow in a cavity.
- **Happiness Detection Project** Jan 2017 - Feb 2017
President election inauguration was taken as input to identify the happy zones in the seating areas. The inauguration photos have been segmented into multiple images. Face detection followed by smile detection was applied in MATLAB for this work.
- **Solver Selection in Finite Element Multiphysics Simulations** Feb 2016 - Dec 2016
Defining of a new set of linear system properties, which are used as the features in the machine learning problem specification. We then apply the classification to a set of examples in the MOOSE framework, achieving high accuracy(99%) when targeting problems in the more limited domain of finite element multi-physics applications.
- **PhD Directed Research Project** Sep 2014 - Oct 2015
Title: Automated selection of numerical solvers
A generalizable machine learning-based workflow for classifying arbitrary sparse linear systems using different-sized feature sets and a comparative analysis of the solver classification results for a variety of input problems belonging to different domains and various machine-learning methods, achieving up to 87% accuracy in identifying the well-performing linear solution methods in PETSc.
- **Master's Thesis** Jan 2014 - Jun 2014
Title: Comparison of FD extraction methods and an application of DFS
Given the raw data, normally looking for Functional Dependency takes exponential time with respect to the number of attributes. Over the past, heuristics have been given to reduce the time using efficient algorithms. My task involved reviewing the algorithms and suggesting an algorithm that can be expected to work more efficiently than the rest.
- **Database Design and Applications** (Masters course project)
Developed a relational database (using MySQL), implemented advanced features like triggers etc. and web-based applications to access this database (using PHP).
- **Compiler Design** (Masters course project)
Developed the Scanner, Parser, Abstract Syntax Tree and Semantic Analysis phases of a compiler for the COOL 2013 language.
- **Data Classification Project** (Masters course project)
Worked on and implemented a few classic classification Machine Learning algorithms (ID3, Naïve Bayes, Logistic Regression, Perceptrons etc.) on real life data sets.
- **Leveraging Natural Language Processing On Sentiment Analysis** (Masters course project)
Leveraged NLTK for the purpose of sentiment analysis on user-generated product reviews using a corpus of reviews extracted from Amazon.com.
- **Face Recognition System** (Bachelors course project)
Took in several facial images and generated an image of the same human with a different expression using the Principal Component Analysis (PCA) technique in MATLAB.

RELEVANT COURSES

Artificial Intelligence, Machine Learning, Data Mining, Compiler Design, Database Processing, Database Issues, Graph Theory, Automata Theory, Introduction to Logic, Algorithms & Complexity, Distributed Systems

HONORS

- Poster accepted at SIAM'17, Mar 2017
- Awarded SIAM Student Travel Award, Feb 2017, \$800
- Served as a mentor on the BE Mentor-Protege Program at SIAM 17, Feb 2017
- Served on SC16 HPC Undergraduate program panel, SC'16, Nov 2016

- Awarded Erwin and Gertrude Juilfs Scholarship, Jun 2016, \$1000
- Awarded SE4SCIENCE travel grant, May 2016, \$500
- Poster accepted at HPDC'15, SPLASH'15, SC'15
- Poster accepted at Graduate Student Research Forum'15 at University of Oregon
- Awarded Graduate Research Fellowship from Sep 2014- Present
- Awarded Graduate Teaching Fellowship from Sep 2012- Jun 2014
- Certified Database Associate of IBM, 2009
- Ranked in top 5% of undergraduate institution, 2008-2011
- Level-1 certified in French language, 2011
- Literary Head of college club Xperia, 2009-2011
- Head of college horse riding committee, 2008-2011
- Third highest scorer in Board Examination (CBSE) Class XII and Class X