

# Preeti Bhargava, PhD

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**Research Interests** Pervasive and Ubiquitous Computing, Context-aware Computing and Systems, Mobile Systems and Applications, User Modeling, Personalization, Recommender systems, Internet of Things

**Education** **University of Maryland, College Park, MD** **August 2010 - December 2015**  
M.S. and Ph.D., Computer Science Cumulative GPA: 3.9/4.0  
*Advisor:* Prof. Ashok Agrawala  
*Dissertation title:* Towards proactive context-aware computing and systems

**Delhi College of Engineering, New Delhi** **August 2003 - May 2007**  
B.E., Information Technology Graduated in First Class with Distinction

## Experience

**Work** **Senior Research Engineer, Data Science, Lithium Technologies** **April 2016 - Present**

- *Lithium's resource-constrained, high-throughput and language-agnostic Natural Language Processing (NLP) pipeline for rich information extraction from noisy user generated content:* Design, implementation and testing of approaches for Entity Disambiguation and Linking, Sentiment Analysis and Entity-Topic association (10 -15% improvement over existing systems) [Machine Learning, NLP, Java, Big Data, Hive, HQL]
- *Improved topical coverage in Klout.com recommendations:* Design, implementation and testing of an approach for improving the coverage of topics in Klout.com URL recommendations (20% improvement over existing approach) [Recommender Systems, Big Data, Hive, HQL]
- *GDPR Compliance:* Reimplementing Klout systems to be legally compliant with GDPR [Big Data, Hive, HQL]
- *IP efforts:* Leading academic writing and publishing efforts for the team

**Senior Member Technical Staff, Oracle India** **July 2007 - July 2010**  
Involved in development and testing of new and existing features in Oracle Web Services Manager (OWSM) 11g, support and portability of OWSM 10g, their interoperability with other products, and troubleshooting [Web Services Security, Java]

**Research Internships** **Samsung Research America - Silicon Valley, Mountain View, CA** **June - August 2015**  
Mentor: Douglas Terry  
*ThingTalk:* Design and implementation of a framework for natural language based interaction within an IoT ecosystem [NLP, Graph databases, Samsung SmartThings home automation devices, Hyper/Cat, Java]

**Samsung Research America - Silicon Valley, San Jose, CA** **June - November 2014**  
Mentors: Thomas Phan, Jiayu Zhou  
*Multi dimensional collaborative recommendations:* Design, implementation and testing of a recommender system and approach for multi-dimensional collaborative recommendations using tensor factorization on sparse user generated data [Recommender Systems, Machine Learning, MATLAB]

**Xerox Palo Alto Research Center (PARC), Palo Alto, CA** **June 2013 - May 2014**  
Mentors: Oliver Brdiczka, Michael Roberts

- *User interest modeling from Facebook profiles:* Design, implementation and testing of an unsupervised algorithm and system for inferring and predicting users' interests based on their Facebook profiles and activities [Recommender Systems, Personalization, User modeling, NLP, Java]

- *Modeling of users' communication context*: Design and implementation of an approach for un-supervised extraction, modeling and representation of users' communication context from social media interactions [User modeling, NLP, Java]

**National Sun Yat-Sen University, Kaohsiung, Taiwan**      **December 2006 - February 2007**

Mentor: Prof. Ting-Peng Liang

Developed a knowledge-based Decision Model Management System using web services integration [Web Services, Java]

**National Informatics Centre, New Delhi, India**

**June - July 2006**

Mentor: Ramesh Singh

Designed, developed and tested easy to use smart phones applications for obtaining live traffic information and information about potential blood donors in emergency situations [Mobile systems, Java]

## Academic

**Graduate Research Assistant**

**June 2011 - May 2015**

Department of Computer Science, University of Maryland, College Park

Designed, implemented and tested various context-aware and mobile systems and applications:

- *Rover III* - An intelligent context-aware middleware [Context-aware Systems, NLP, Machine Learning, HTN Planning, RDF/OWL, Java, Graph databases, SQL databases]
- *TellMe* - An infrastructure for bootstrapped discovery and ranking of relevant services and information in context-aware systems [Context-aware Computing, NLP, Java, Android]
- *SenseMe* - A smartphone-based system for continuous, on-device, and multi-dimensional context and activity recognition [Ubiquitous Computing, Machine Learning, Android, SQL Databases]
- *Locus* - An indoor localization, tracking and navigation system for multi-story buildings, and its Android based client applications [Mobile Systems, Machine Learning, Java, Android]
- *Robot in a Room* - Integrating perception, language, learning and cognition to enable autonomy in a robot [Robotics, MATLAB]

**Teaching Assistant**

**August 2010 - May 2011**

Department of Computer Science, University of Maryland, College Park

TA for courses: Introduction to Artificial Intelligence and Object Oriented Programming I

## Undergraduate Research

**Major Dissertation**

**February 2007 - May 2007**

Advisor: Prof. D Roy Choudhury

Developed a system of Artificial Neural Networks to predict the results of cricket tournaments [Machine Learning, MATLAB]

**Minor Dissertation**

**August 2006 - December 2006**

Advisor: Prof. Goldie Gabrani

Developed a Genetic Algorithm based tool to identify the best combinations of Indian music loops [Machine Learning, C++]

## Software Skills

*Programming Languages*: Java (J2SE and J2EE), C/C++, Python

*Mobile platforms*: Android, J2ME

*Databases/Data Modeling*: SQL, NoSQL, RDF/OWL

*Big Data Platforms, Technologies and Languages*: Hadoop, MapReduce, Hive, HQL

*Machine Learning/Data Mining packages*: Weka, MATLAB, Octave

*Hardware*: Arduino

*OS, Software and Tools*: Linux, Mac OS, Windows, Eclipse, IntelliJ, SVN, Tomcat, Git, Jenkins

## Honors and Awards

UMD Ann G. Wylie Dissertation Fellowship (\$10000)

**2015**

Google WWW Student Travel Grant

**2015**

IUI Student Travel Award	2015
Palantir Scholarship for Women in Technology Finalist (\$2500)	2014
Jacob K. Goldhaber Travel Grant	2014
UMD International Conference Student Support Award	2014
Grace Hopper Celebration of Women in Computing Scholarship	2012
UMD Department of Computer Science Travel Grant	2012
UMD Dean's Fellowship (\$5000)	2010 - 2012

**Patents** P. Bhargava and O. Brdiczka, *Computer-implemented system and method for generating an interest profile for a user from existing online profiles.*, **U.S. Patent 9600561**, issued March 2017

## Publications

**PhD Dissertation** P. Bhargava, *Towards proactive context-aware computing and systems*, **Department of Computer Science, University of Maryland, College Park (2015)**

## Journal

P. Bhargava, A. Agrawala, *Modeling Users' Behavior from Large Scale Smartphone Data Collection*, **EAI Endorsed Transactions on Context-aware Systems and Applications (2016)**

P. Bhargava, N. Gramsky, A. Agrawala, *To Sense or not to Sense: An Exploratory Study of Privacy, Trust and other related concerns in Personal Sensing Applications*, **EAI Endorsed Transactions on Context-aware Systems and Applications (2016)**

P. Bhargava, S. Krishnamoorthy, A. Shrivastava, A.K. Nakshathri, M. Mah, A. Agrawala, *Locus: Robust and Calibration-free Indoor Localization, Tracking and Navigation for Multi-story Buildings'*, **Journal of Location based Services (2015)**

P. Bhargava, J. Lampton, A. Agrawala, *Bootstrapped Discovery and Ranking of Relevant Services and Information in Context-aware Systems*, **EAI Endorsed Transactions on Context-aware Systems and Applications (2015)**

P. Bhargava, A. Agrawala, *Enabling Proactivity in Context-aware Middleware Systems by means of a Planning Framework based on HTN Planning*, **EAI Endorsed Transactions on Context-aware Systems and Applications (2015)**

S. Krishnamoorthy, P. Bhargava, M. Mah, A. Agrawala, *Representing and Managing the Context of a Situation*, **The Computer Journal (2012)**

R. Singh, P. Bhargava, S. Kain, *Smart Phones to the Rescue: The Virtual Blood Bank Project*, **IEEE Pervasive Computing (2007)**

D. R. Choudhury, P. Bhargava, Reena, S. Kain, *Use of Artificial Neural Networks for Predicting the Outcome of Cricket Tournaments*, **International Journal of Sports Science and Engineering (2007)**

## Conferences and Workshops

G. Hu, P. Bhargava, S. Fuhrmann, S. Ellinger and N. Spasojevic, *Analyzing users' sentiment towards popular consumer industries and brands on Twitter*, **ICDM 2017 Workshop on Sentiment Elicitation from Natural Text for Information Retrieval and Extraction (SENTIRE'17)**

P. Bhargava, N. Spasojevic, G. Hu, *Lithium NLP: A System for Rich Information Extraction from Noisy User Generated Text on Social Media*, **EMNLP 2017 Workshop on Noisy User Generated Text (WNUT'17)**

P. Bhargava, N. Spasojevic, G. Hu, *High-Throughput and Language-Agnostic Entity Disambiguation and Linking on User Generated Data*, **WWW 2017 Linked Data on the Web workshop (LDOW'17)**

N. Spasojevic, P. Bhargava, G. Hu, *DAWT: Densely Annotated Wikipedia Texts across multiple languages*, **WWW 2017 Wiki workshop (Wiki'17)**

P. Bhargava, J. Lampton, A. Agrawala, *Bootstrapped Discovery and Ranking of Relevant Services and*

*Information in Context-aware Systems*, **International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services 2015 (MobiQuitous 2015)**

P. Bhargava, A. Agrawala, *Enabling Proactivity in Context-aware Middleware Systems by means of a Planning Framework based on HTN Planning*, **International Workshop on Web Intelligence and Smart Sensing 2015 (IWWISS 2015)**

P. Bhargava, T. Phan, J. Zhou, J. Lee, *Who, What, When, and Where: Multi-Dimensional Collaborative Recommendations using Tensor Factorization on Sparse User Generated Data*, **International World Wide Web Conference 2015 (WWW 2015)**

P. Bhargava, O. Brdiczka, M. Roberts, *Unsupervised Modeling of Users' Interests from their Facebook Profiles and Activities*, **ACM conference on Intelligent User Interfaces 2015 (IUI 2015)**

P. Bhargava, O. Brdiczka, M. Roberts, *Mining users' online communication for improved interaction with context-aware systems*, **IUI Workshop on Interacting with Smart Objects 2015**

P. Bhargava, N. Gramsky, A. Agrawala, *SenseMe: A System for Continuous, On-Device, and Multi-dimensional Context and Activity Recognition*, **International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services 2014 (MobiQuitous 2014)**

P. Bhargava, S. Krishnamoorthy, A. K. Nakshathri, M. Mah, A. Agrawala, *Locus: An indoor localization, tracking and navigation system for multi-story buildings using heuristics derived from Wi-Fi signal strength*, **International Conference on Mobile and Ubiquitous Systems: Computing, Networking and Services 2012 (MobiQuitous 2012)**

P. Bhargava, M. T. Cox, T. Oates, U. Oh, M. Paisner, D. Perlis, J. Shamwell, *The Robot Baby and Massive Metacognition: Future Vision*, **IEEE International Conference on Development and Learning and Epigenetic Robotics 2012 (ICDL 2012)**

J. Shamwell, T. Oates, P. Bhargava, M. T. Cox, U. Oh, M. Paisner, D. Perlis, *The Robot Baby and Massive Metacognition: Early Steps via Growing Neural Gas*, **IEEE International Conference on Development and Learning and Epigenetic Robotics 2012 (ICDL 2012)**

P. Bhargava, S. Krishnamoorthy, A. Agrawala, *An ontological context model for representing a situation and the design of an intelligent context-aware middleware*, **ACM Conference on Ubiquitous Computing 2012 (UbiComp 2012)**

P. Bhargava, S. Krishnamoorthy, A. Agrawala, *RoCoMO: A generic ontology for context modeling, representation and reasoning*, **ACM Conference on Ubiquitous Computing 2012 (UbiComp 2012)**

**Other Publications**

R. Singh, P. Bhargava, S. Kain, *Smart Phones: A Tutorial*, **ACM Ubiquity (2008)**

R. Singh, P. Bhargava, S. Kain, *Smart phones and interactive reports leave traffic in the rearview mirror*, **IEEE Potentials (2008)**

G. Gabrani, P. Bhargava, Bhawna, G. S. Gill, *Use of Genetic Algorithms for Indian Music Mixing*, **ACM Ubiquity (2008)**

R. Singh, P. Bhargava, S. Kain, *Cell phone cloning: A perspective on GSM security*, **ACM Ubiquity (2007)**

R. Singh, P. Bhargava, S. Kain, *State of the art Smart Spaces: Application Models and Software Infrastructure*, **ACM Ubiquity (2006)**

**Relevant Coursework**

Scientific Computing, Information-centric design of systems, Database Management Systems, Information Visualization, Machine Learning, Computational Linguistics, Social Network Databases, Human-Level AI and Computational Cognitive Neuroscience, Tangible Interactive Computing

**Professional Service**

**Reviewer for conferences and journals:** IEEE Transactions on Mobile Computing, IWCMC 2015, CHI 2013 Workshop on Personal Informatics

**Reviewer for:** Admissions Committee, Dept. of Computer Science, UMD for Fall 2013 applicants

<b>Leadership,</b>	Speaker and volunteer, CRA-W	<i>2017</i>
<b>Volunteering and</b>	Grad co-chair of the Association of Women in Computing (AWC), UMD	<i>2014 - 2015</i>
<b>Extracurricular</b>	Mentor, HuffingtonPost Girls in STEM Mentorship Program	<i>2013</i>
<b>Activities</b>	UMD Graduate Research Interaction Day (GRID) volunteer and panelist	<i>2013</i>
	Volunteer, Maryland Day	<i>2012, 2013</i>
	Student Volunteer, ACM MobiSys Conference	<i>2011</i>