

Prashant Pandey

ACADEMIC INTEREST My research interests lie at the intersection of Systems and Algorithms.
Expertise: Data Structures and Algorithms for Big-Data, File Systems and Security.

CONTACT INFORMATION 165 5th Street St. James, NY - 11780 E-mail:ppandey@cs.stonybrook.edu E-mail:prashant.prashn@gmail.com Phone: (+1) 631-949-6948

EDUCATION **Stony Brook University**, Stony Brook, NY Expected Graduation: May 2018
PhD, Computer Science GPA (3.8/4.0)
Advisors:
Michael Bender: <https://www.cs.stonybrook.edu/people/faculty/MichaelBender>
Rob Johnson: <https://www.cs.stonybrook.edu/people/faculty/RobJohnson>

University of Pune, Pune, India August 2007 - June 2011
Bachelor of Engineering, Information Technology

RESEARCH PAPERS **Mantis: A Fast, Small, and Exact Large-Scale Sequence-Search Index** *RECOMB 2018 (Submitted)*
Prashant Pandey, Fatemeh Almodaresi, Michael A. Bender, Michael Ferdman, Rob Johnson, and Rob Patro

Rainbowfish: A Succinct Colored de Bruijn Graph Representation *WABI 2017*
Fatemeh Almodaresi, Prashant Pandey, and Rob Patro

Squeakr: An Exact and Approximate k-mer Counting System *BIOINFORMATICS 2017*
Prashant Pandey, Michael A. Bender, Rob Patro, and Rob Johnson

A Fast x86 Implementation of Select *arxiv 2017*
Prashant Pandey, Michael A. Bender, and Rob Johnson

deBGR: An Efficient and Near-Exact Representation of the Weighted de Bruijn Graph *ISMB 2017*
Prashant Pandey, Michael A. Bender, Rob Patro, and Rob Johnson

A General-Purpose Counting Filter: Making Every Bit Count *SIGMOD 2017*
Prashant Pandey, Michael A. Bender, Rob Patro, and Rob Johnson

Writes Wrought Right, and Other Adventures in File System Optimization *TOS 2016*
Jun Yuan, Yang Zhan, William Jannen, Prashant Pandey, Amogh Akshintala, Kanchan Chandnani, Pooja Deo, Zardosht Kasheff, Michael Bender, Martin Farach-Colton, Rob Johnson, Bradley C. Kuszmaul, and Donald E. Porter

Optimizing Every Operation in a Write-Optimized File System *FAST 2016*
Jun Yuan, Yang Zhan, William Jannen, Prashant Pandey, Amogh Akshintala, Kanchan Chandnani, Pooja Deo, Zardosht Kasheff, Michael Bender, Martin Farach-Colton, Rob Johnson, Bradley C. Kuszmaul, and Donald E. Porter

BetrFS: Write-Optimization in a Kernel File System *TOS 2015*
William Jannen, Jun Yuan, Yang Zhan, Amogh Akshintala, John Esmet, Yizheng Jiao, Ankur Mittal, Prashant Pandey, Phaneendra Reddy, Leif Walsh, Michael A. Bender, Martin Farach-Colton, Rob Johnson, Bradley C. Kuszmaul, and Donald E. Porter

BetrFS: A Right-Optimized Write-Optimized File System *FAST 2015*
William Jannen, Jun Yuan, Yang Zhan, Amogh Akshintala, John Esmet, Yizheng Jiao, Ankur Mittal, Prashant Pandey, Phaneendra Reddy, Leif Walsh, Michael A. Bender, Martin Farach-Colton, Rob Johnson, Bradley C. Kuszmaul, and Donald E. Porter

RESEARCH
INTERNSHIPS

Making Spanner minimally massive @Google *Summer 2017*

- Worked on the core data structures of Spanner, Google's geo-distributed big database.

Cryptographic integrity for EXT4 @Google *Summer 2016*

- Implemented cryptographic integrity using AES-256-GCM in Ext4 file system.
- Also, implemented an in-kernel authenticated skiplist data structure to store integrity metadata.
- File system level integrity protection against offline attacks.

Secure Cloud Stack using Intel SGX technology @Intel Labs *Summer 2014, 2015*

- Developed an encrypted FUSE file system using Intel SGX technology.
- Successfully ported a Java Virtual Machine (JVM) inside an SGX enclave.
- Application: Secure Compute and Secure Storage in cloud space.

PATENT
APPLICATIONS

- INSTRUCTIONS THAT FACILITATE THE IMPLEMENTATION OF THE FORK SYSTEM CALL IN PROCESSES USING SOFTWARE GUARD EXTENSIONS
- APPARATUS AND METHOD FOR IMPLEMENTING A FORKED SYSTEM CALL IN A SYSTEM WITH A TRUSTED ENCLAVE

ACADEMIC
PROJECTS

Preemptive Operating System [CSE-506] *August 2013 - December 2013*

- Developed a pre-emptive kernel OS from scratch.
- This kernel handles user I/O, software and hardware interrupts, system calls, timer based scheduling etc.
- Project URL: <https://github.com/prashantpandey/preemptive-os>

Compiler for Language E- [CSE-504] *February 2014 - May 2014*

- Developed a compiler from scratch for the language E-.
- The project involved lexical analysis, semantic analysis, type checking, intermediate code generation, optimization and machine code generation.
- Project URL: https://github.com/prashantpandey/E--_compiler

Client-Server model using Chain Replication for supporting Fault-Tolerance and High Availability [CSE-535] *August 2014 - December 2014*

- In this course project, we implemented a client-server model for the chain replication algorithm for high-availability and fault-tolerance. It is implemented in two different languages: DistAlgo and NodeJs.
- Project URL: <https://github.com/prashantpandey/ChainReplicationDistributedSystem>

Long Reads Genome Assembly [CSE-549] *August 2013 - December 2013*

- We implemented the first component of a de-novo assembler for long reads obtained from a PacBio RS sequencing machine. <http://schatzlab.cshl.edu/teaching/2013/pacbioasm.shtml#!>
- Project URL: <https://github.com/prashantpandey/longread-genomeassembly>

TECHNICAL
SKILLS

Programming Languages: C/C++, Java, Python, NodeJs

WORK
EXPERIENCE

Research Assistant, Algorithms Lab, Stony Brook University *August 2014 - Present*

- Compact data structures for membership query and approximate counting
- Write-optimized file systems

Research Intern, Google *Summer 2016, 2017*

Cryptographic integrity for Ext4 and data structures in Spanner

Research Intern, Intel Labs *Summer 2014, 2015*

Secure Cloud Stack using Intel SGX Technology

Member Technical Staff, TIBCO Software India Ltd *July 2011 - June 2013*

ActiveMatrix Platform Development

- Developed AMX JRE updater utility for the existing installations of ActiveMatrix SB/SG product suite.
- Designed and developed AMX Messaging Bus Cleanup tool to destroy the orphan queues from the AMX Messaging Bus backbone.
- Wrote an Eclipse plugin for Graph Dependency Analyzer using Eclipse Zest plugin. <http://www.eclipse.org/gef/zest/>

Project Intern, Symantec India Ltd *August 2010 - April 2011*

Open-Source Desktop Search Engine using Apache Lucene and Apache Tika

- Successfully implemented features: environment specific search, CPU utilization intelligence, Index file portability and media index integration.
- Project URL: <http://github.com/opensourcedse>

TEACHING
EXPERIENCE

Teaching Assistant, CS Dept, Stony Brook University

August 2013 - Dec 2015

- CSE 110: Introduction to Computer Science (Advanced Java)
- CSE 535: Asynchronous Systems
- CSE 548: Analysis of Algorithms

AWARDS AND
ACHIEVEMENTS

- A Special CS Department Chair Fellowship, Stony Brook University.
- University Rank Holder, (Dept. of Information Technology VIIT, University of Pune).
- Academic Excellence Scholarship from Dept. of Information Technology VIIT, University of Pune.

LINKS

GitHub

<https://github.com/prashantpandey>

Linked profile

<http://www.linkedin.com/pub/prashant-pandey/14/1a6/581>

Personal Website

<http://www3.cs.stonybrook.edu/~ppandey>