

# Venkatesh Prasad Ranganath

<http://rvprasad.com>

## Education

- Ph.D. (Computer Science), Kansas State University, USA. (2006)  
– *Scalable and Accurate Approaches to Program Dependence Analysis, Slicing, and Verification of Concurrent Object Oriented Programs*
- M.S. (Computer Science), Kansas State University, USA. (2002)  
– *Object-flow analysis for optimizing finite-state models of Java Software*
- B.E. (Computer Science and Engineering), Bangalore University, India. (1997)

## Employment

- Assistant Professor, Kansas State University, USA. (Aug 2015 – Present)
- Visiting Assistant Professor, Kansas State University, USA. (Feb 2014 – Aug 2015)
- Researcher, Microsoft Research, India. (Aug 2007 – Aug 2013)
- Software Engineer, Agitar Software, USA. (Sep 2006 – May 2007)
- Instructor, Kansas State University, USA. (Sep 2005 – Apr 2006)
- Graduate Research Assistant, Kansas State University, USA. (May 2002 – Aug 2005)
- Graduate Teaching Assistant, Kansas State University, USA. (Sep 1999 – Apr 2002)
- Software Engineer, Wipro Global R&D (Wipro Technologies), India. (Sep 1997 – Jul 1999)

## Peer-reviewed Journal Publications

1. *Mining Quantified Temporal Rules: Formalism, Algorithms, and Evaluation* – David Lo, G. Ramalingam, Venkatesh Prasad Ranganath, and Kapil Vaswani. *Science of Computer Programming (SCP)*, Volume 77, Issue 6, 2012.
2. *Logical Concurrency Control from Sequential Proofs* – Jyotirmoy Deshmukh, G. Ramalingam, Venkatesh Prasad Ranganath, and Kapil Vaswani. *Logical Methods in Computer Science (LMCS)*, Volume 7, Issue 3, 2011.
3. *A New Foundation For Control-Dependence and Slicing for Modern Program Structures* – Venkatesh Prasad Ranganath, Torben Amtoft, Anindya Banerjee, Matthew B. Dwyer, and John Hatcliff. *ACM Transactions on Programming languages and Systems (TOPLAS) - Special Issue ESOP 2005*, Volume 20, Issue 5, 2007.
4. *Slicing Concurrent Java Programs using Indus and Kaveri* – Venkatesh Prasad Ranganath and John Hatcliff. Special section of the *International Journal on Software Tools for Technology Transfer (STTT)*, Volume 9, Issue 5-6, 2007.

5. *Exploiting Object Escape and Locking Information in Partial-Order Reductions for Concurrent Object-Oriented Programs* – Matthew B. Dwyer, John Hatcliff, Robby, and Venkatesh Prasad Ranganath. *International Journal on Formal Methods in System Design (FMSD)*, Volume 25, 2004.

### Peer-reviewed Conference/Workshop Publications

1. *Why do Users Kill HPC Jobs?* – Venkatesh-Prasad Ranganath and Daniel Andresen. *International Conference on High Performance Computing, Data, and Analytics, HiPC 2018*. Acceptance: 22%
2. *Ghera: A Repository of Android App Vulnerability Benchmarks* – Joydeep Mitra and Venkatesh-Prasad Ranganath. *International Conference on Predictive Modeling and Data Analytics in Software Engineering, PROMISE 2017*.
3. *Experimental Study with Real-world Data for Android App Security Analysis using Machine Learning* by Sankardas Roy, Jordan DeLoach, Yuping Li, Doina Caragea, Xinming Ou, Nicolae Herndon, Venkatesh Prasad Ranganath, HongMin Li, and Nicolais Guevara. *Annual Computer Security Applications Conference, ACSAC 2015*. Acceptance: 24.4%
4. *Ecosphere Principles for Medical Application Platforms* by Yu Jin Kim, Venkatesh-Prasad Ranganath, John Hatcliff, Robby and Sam Procter. *International Conference on Healthcare Informatics, ICHI 2015*.
5. *Communication Patterns for Interconnecting and Composing Medical Systems* – Venkatesh-Prasad Ranganath, Yu Jin Kim, John Hatcliff, and Robby. *International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC 2015*. (Reviewed Invited Paper)
6. *Integrated Clinical Environment Device Model: Stakeholders and High Level Requirements* – Yu Jin Kim, John Hatcliff, Venkatesh-Prasad Ranganath, Robby, and Sandy Weininger. *Medical Cyber Physical Systems Workshop, Medical CPS 2015*.
7. *Compatibility Testing using Patterns-based Trace Comparison* – Venkatesh-Prasad Ranganath, Pradip Vallathol, and Pankaj Gupta. *International Conference on Automated Software Engineering, ASE 2014*. Acceptance: 19.9%
8. *Extrinsic Influence Factors in Software Reliability: A Study of 200,000 Windows Machines* – Christian Bird, Venkatesh Prasad Ranganath, Thomas Zimmermann, Nachiappan Nagappan, and Andreas Zeller. *International Conference on Software Engineering (SEIP track), ICSE 2014*. Acceptance: 21%
9. *Structural and Temporal Patterns-based Features* – Venkatesh Prasad Ranganath and Jithin Thomas. *International Workshop on Data Analysis Patterns in Software Engineering, DAPSE 2013*.
10. *Logical Concurrency Control from Sequential Proofs* – Jyotirmoy Deshmukh, G. Ramalingam, Venkatesh Prasad Ranganath, and Kapil Vaswani. *European Symposium on Programming, ESOP 2010*. Acceptance: 25%

WINNER OF ETAPS BEST PAPER AWARD.

11. *Mining Quantified Temporal Rules: Formalism, Algorithms, and Evaluation* – David Lo, G. Ramalingam, Venkatesh Prasad Ranganath, and Kapil Vaswani. *Working Conference on Reverse Engineering, WCRE 2009*. Acceptance: 25.3%
12. *Isolator: Dynamically Ensuring Isolation in Concurrent Programs* – G. Ramalingam, Sriram K. Rajamani, Venkatesh Prasad Ranganath, and Kapil Vaswani. *International Conference on Architectural Support for Programming Languages and Operating Systems, ASPLOS 2009*. Acceptance: 26%
13. *An Overview of the Indus Framework for Analysis and Slicing of Concurrent Java Software* – Venkatesh Prasad Ranganath and John Hatcliff. *International Workshop on Source Code Analysis and Manipulation, SCAM 2006*. (Keynote)
14. *Evaluating the Effectiveness of Slicing for Model Reduction of Concurrent Object-Oriented Programs* – Matthew B. Dwyer, John Hatcliff, Matthew Hoosier, Venkatesh Prasad Ranganath, Robby, and Todd Wallentine. *International Conference on Tools and Algorithms for the Construction and Analysis of Systems, TACAS 2006*. Acceptance: 27%
15. *Automatic code generation for LYE, a high-performance caching SOAP implementation* – Venkatesh Prasad Ranganath, Andrew King, and Daniel Andresen. *International Conference on Semantic Web and Web Services, SWWS 2006*. Acceptance: 32%
16. *Towards highly optimized real-time middleware for software product-line architectures* – Arvind S Krishna, Aniruddha Gokhale, Douglas C. Schmidt, Venkatesh Prasad Ranganath, and John Hatcliff. *ACM SIGBED Review - Special issue: The work-in-progress (WIP) session of the RTSS 2005*.
17. *A New Foundation For Control-Dependence and Slicing for Modern Program Structures* – Venkatesh Prasad Ranganath, Torben Amtoft, Anindya Banerjee, Matthew B. Dwyer, and John Hatcliff. *European Symposium on Programming, ESOP 2005*. Acceptance: 24.5%
18. *Kaveri: Delivering Indus Java Program Slicer to Eclipse* – Ganeshan Jayaraman, Venkatesh Prasad Ranganath, and John Hatcliff. *International Conference on Fundamental Approaches to Software Engineering, FASE 2005*.
19. *LYE: high performance SOAP with multi-level caching* – Venkatesh Prasad Ranganath, David Saxton, and Daniel Andresen. *International Conference on Parallel and Distributed Computing and Systems, PDCS 2004*. Acceptance: 66%  
NOMINATED FOR BEST PAPER AWARD.
20. *LYE: a high performance caching SOAP implementation* – Daniel Andresen, David Saxton, Kiran Devaram, and Venkatesh Prasad Ranganath. *International Conference on Parallel Processing, ICPP 2004*. Acceptance: 34.2%
21. *Pruning Interference and Ready Dependence for Slicing Concurrent Java Programs* – Venkatesh Prasad Ranganath and John Hatcliff. *International Conference on Compiler Construction, CC 2004*. Acceptance: 32.7%
22. *A Correlation Framework for CORBA Component Model* – Georg Jung, John Hatcliff, and Venkatesh Prasad Ranganath. *International Conference on Fundamental Approaches to Software Engineering, FASE 2004*. Acceptance: 24.1%

23. *Cadena: An Integrated Development Environment for Analysis, Synthesis, and Verification of Component-based Systems* – Adams Child, Jesse Greenwald, Venkatesh Ranganath, Xi-anhua Deng, Matthew Dwyer, John Hatcliff, Georg Jung, Prashant Shanti, and Gurdip Singh. *International Conference on Fundamental Approaches to Software Engineering, FASE 2004*.
24. *A Set-based Approach to Packet Classification* – Venkatesh Prasad Ranganath and Daniel Andresen. *International Conference on Parallel and Distributed Computing and Systems, PDCS 2003*. Acceptance: 66%  
NOMINATED FOR BEST PAPER AWARD.
25. *CADENA: Enabling CCM-based Application Development in Eclipse* – Venkatesh Prasad Ranganath, Adam Childs, Jesse Greenwald, Matthew B. Dwyer, John Hatcliff and Gurdip Singh. *Workshop on eclipse technology exchange, eTX 2003*.
26. *Cadena: An Integrated Development, Analysis, and Verification Environment for Component-based Systems* – John Hatcliff, William Deng, Matthew B. Dwyer, Georg Jung, and Venkatesh Prasad Ranganath. *International Conference on Software Engineering, ICSE 2003*. Acceptance: 12.9%
27. *Slicing and Partial Evaluation of CORBA Component Model Designs for Avionics System* – John Hatcliff, William Deng, Matthew B. Dwyer, Georg Jung, Venkatesh Prasad Ranganath, and Robby. *Workshop on Partial Evaluation and Program Manipulation, PEPM 2003*.

### Book Chapters

1. *Embrace Dynamic Artifacts in Perspectives on Data Science for Software Engineering*, 2016. Published by Morgan Kaufmann. ISBN: 978-0128042069.
2. *While Models are Good, Simple Explanations are Better in Perspectives on Data Science for Software Engineering*, 2016. Published by Morgan Kaufmann. ISBN: 978-0128042069.

### Miscellaneous Publications

1. *Are Free Android App Security Analysis Tools Effective in Detecting Known Vulnerabilities?* – Venkatesh-Prasad Ranganath and Joydeep Mitra. 2018
2. *Localized Disaster Networks Platform* – Venkatesh-Prasad Ranganath, Hyung Jin Kim, and Daniel Andresen. 2017
3. *Controlling Non-determinism for Semantic Guarantees* – Sriram Rajamani, G. Ramalingam, Venkatesh Prasad Ranganath, and Kapil Vaswani. *Exploiting Concurrency Efficiently and Correctly, (EC)<sup>2</sup>, a CAV 2008 workshop*.
4. *Component-Oriented Programming and Datacenter Applications* – Venkatesh Prasad Ranganath. *The Rise and Rise of the Declarative Datacentre (R2D2)*. 2008
5. *Enabling Efficient Partial Order Reductions for Model Checking Object-Oriented Programs Using Static Calculation of Program Dependences* – Venkatesh Prasad Ranganath, John Hatcliff, and Robby. 2007
6. *Notes on Interference Dependences* – Venkatesh Prasad Ranganath. 2007

7. *Notes on Atomicity* – Venkatesh Prasad Ranganath. 2006.
8. *Enriching Component Interfaces with Checkable Dependence Specifications* – Venkatesh Prasad Ranganath, Georg Jung, John Hatcliff, and Matthew B. Dwyer. 2005

## Patents

1. *Compatibility Testing Using Traces, Linear Temporal Rules, and Behavioral Models* – Randall Edward Aull, Pankaj Bharti Gupta, Robert Eugene Harris Jr, Jane Evguenia Lawrence, Venkatesh-Prasad Ranganath, and Pradip Harindran Vallathol, 2012. Patent US 8892493 B2. (Pending)
2. *Temporal Rule-Based Feature Definition and Extraction* – Venkatesh-Prasad Ranganath, Piyush Goyal, Pradip Harindran Vallathol, and Ganesan Ramalingam, 2010. Patent US 8538909 B2.
3. *Abstracting Events for Data Mining* – David Lo, Ganesan Ramalingam, Venkatesh-Prasad Ranganath, and Kapil Vaswani, 2009. Patent US 8280899 B2.
4. *Identifying Concurrency Control from a Sequential Proof* – Ganesan Ramalingam, Sriram Rajamani, Venkatesh-Prasad Ranganath, Kapil Vaswani, and Jyotirmoy Vinay Deshmukh, 2008. Patent US 20100169618 A1. (Pending)
5. *System to Reduce Interference in Concurrent Programs* – Sriram Rajamani, Ganesan Ramalingam, Venkatesh-Prasad Ranganath, and Kapil Vaswani, 2008. Patent US 7941616 B2.

## Courses

Created and taught *CIS890 - SAT Solving*. Spring 2018.

Created and taught *CIS640 - Software Testing Techniques*. Spring 2016 and 2017.

Created and taught *CIS841 - Verification and Validation*. Fall 2015, 2016, and 2017.

Taught *CIS771 - Software Specification*. Spring 2015.

## Software Highlights

**Ghera** Repository of Android App Vulnerability Benchmarks.

<https://bitbucket.org/secure-it-i/android-app-vulnerability-benchmarks/>  
*Technologies:* Java and Android

**Tark** Toolkit to mine structural and linear temporal patterns.

<http://research.microsoft.com/en-us/projects/tark> (1530 downloads)  
*Technologies:* C# and F#

**Indus** Library to analyze and slice concurrent Java programs.

<http://indus.projects.cis.ksu.edu> (110,000+ downloads until 2016)  
*Technologies:* Java and Eclipse

**Cadena** Toolkit to design, analyze, and synthesize component-based systems.

<http://cadena.projects.cis.ksu.edu> (21,000+ downloads until 2016)  
*Technologies:* Java and Eclipse

**Bandera** Toolkit to verify Java programs.

<http://bandera.projects.cis.ksu.edu>

(24,000+ downloads until 2016)

*Technologies:* Java and Eclipse

## Service

Organization.

Social Media Chair of International Symposium of Foundations of Software Engineering (FSE) 2016.

Local co-chair of Asian Symposium on Programming Languages and Systems (APLAS) 2008.

Program committee member at following venues.

*ACSEAC'12* African Conference on Software Engineering & Applied Computing

*CSI'06* National Annual Convention, organized by the Computer Society of India

*DAPSE'13* International Workshop on Data Analysis Patterns in Software Engineering

*ICIIT'18* International Conference on Intelligent Information Technologies

*ISEC'13,'12,'11,'10,'09* India Software Engineering Conference

*ISSRE'12* International Symposium on Software Reliability Engineering

*PADTAD'12* Workshop on Parallel and Distributed Systems: Testing, Analysis, and Debugging

*SEDE '12* International Conference on Software Engineering and Data Engineering

*RV '12* International Conference on Runtime Verification

Reviewer for following journals.

*EMSE* Empirical Software Engineering

*JCST* Journal of Computer Science and Technology

*JOT* Journal of Object Technology

*SCP* Science of Computer Programming

*STTT* International Journal on Software Tools for Technology Transfer

*TECS* ACM Transactions on Embedded Computing Systems

*TOPLAS* ACM Transactions on Programming Languages and Systems

*TOSEM* ACM Transactions on Software Engineering and Methodology

*TSE* IEEE Transactions on Software Engineering

External reviewer at following venues.

*APLAS'08* Asian Symposium on Program Languages and Systems

*ATVA'13* International Symposium on Automated Technology for Verification and Analysis

*CAV'09* Computer Aided Verification

*DEBS'05* International Workshop on Distributed Event-Based Systems

*EAIT'06* International Conference on Emerging Applications of IT  
*eTX'04* Eclipse Technology Exchange Workshop  
*FASE'04* Fundamental Approaches to Software Engineering  
*FSE'09* Foundations of Software Engineering  
*FTFJP'05* ECOOP Workshop on Formal Techniques for Java-like Programs  
*ICISS'09* International Conference on Information Systems Security  
*ICSE'10, '09, '08* International Conference on Software Engineering  
*ISSTA'08* International Symposium on Software Testing and Analysis  
*OOPSLA'09* International Conference on Object Oriented Programming, Systems, Languages and Applications  
*NFM'16* NASA Formal Methods Symposium  
*PASTE'05* Workshop on Program Analysis for Software Tools and Engineering  
*PLAS'06* Workshop on Programming Languages and Analysis for Security  
*PLDI'06, '04* International Conference on Programming Language Design and Implementation  
*POPL'09, '07, '06* Symposium on Principles of Programming Languages  
*PPOPP'11* Annual Symposium on Principles and Practice of Parallel Programming  
*SAS'06* International Static Analysis Symposium  
*SAVCBS'05* Specification and Verification of Component-Based Systems Workshop Engineering  
*TACAS'08* International Conference on Tools and Algorithms for Construction and Analysis of Systems

Member of Agency Review Panels.

*NSF* National Science Foundation 2016, 2018

*DOE* Department of Energy 2016