

**FRANCISCO SERVANT**

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**RESEARCH INTERESTS**

My research focuses on software development productivity and software quality. I use software evolution analysis and program analysis to create practical, efficient, and human-friendly techniques and tools that provide automatic support for all stages of software development.

**RESEARCH KEYWORDS**

Software engineering; software development productivity; mining software repositories; program comprehension; expertise identification; software evolution; software visualization

**EMPLOYMENT**

**Virginia Polytechnic Institute and State University, Blacksburg, VA** **August 2015 – Present**  
**Assistant Professor**

I perform research in software development productivity, mining software repositories, program analysis, and computer-supported collaborative work.

**University of California, Irvine, CA** **March 2008 – June 2015**  
**Graduate Research Assistant**

I performed research in software development productivity, mining software repositories, program analysis, and computer-supported collaborative work.

**Microsoft Research, Redmond, WA** **June 2011 – Sept. 2011**  
**Research Intern**

I performed research to mitigate the complexity of branching within the development process, and I implemented a tool to report my findings.

**DreamWorks Animation, Glendale, CA** **June 2008 – Sept. 2008**  
**Research & Development Intern**

I surveyed developers to study how they used the internal revision-control system. I also designed new architectures, performed bug fixes, added test cases and implemented new features for it.

**Microsoft Corporation, Madrid, Spain** **July 2005 – July 2007**  
**SQL Server Development Support Engineer**

I provided reactive support for administration and development of SQL Server for European customers by phone, email, and on-site. I frequently resolved critical situations with direct impact on the customer's business.

**Valeo Lighting Systems, Martos, Spain** **Aug. 2004 – Oct. 2004**  
**Software Engineer Intern**

I designed and implemented an automated technical support system, deployed cryptography infrastructure (PGP), and performed technical support tasks for Microsoft software.

## EDUCATION

- Ph.D. in Software Engineering** **Sept. 2009 – June 2015**  
 University of California, Irvine  
 Advisor: James A. Jones  
 Dissertation Title: *“A Characterization and Partial Automation of the Multi-revision, Fine-grained Analysis of Code History as an Efficient and Accurate Mechanism to Support Software Development”*
- M.S. in Information and Computer Sciences, Software track** **Sept. 2007 – Aug. 2009**  
 University of California, Irvine  
 Advisor: André van der Hoek  
 Thesis Title: *“Spheres of Influence: Enhancing Support of Indirect Conflicts through Workspace Awareness”*
- B.S. in Computer Science** **Sept. 2000 – Dec. 2005**  
 University of Granada, Spain  
 Advisor: Juan Carlos Torres  
 Thesis Title: *“Snap: A Dental Prints Recognition System”*

## ADDITIONAL EDUCATION

- Teaching Excellence Program** **April 2015 – June 2015**  
 University of California, Irvine
- Science Communication Program** **Jan 2015 – March 2015**  
 Physics Department, University of California, Irvine
- Power Speech Public Speaking Program** **April 2014 – June 2014**  
 Drama Department, University of California, Irvine
- Mentoring Excellence Program** **May 2014 – June 2014**  
 University of California, Irvine
- Mining Software Repositories Summer School** **June 2010**  
 School of Computing, Queen’s University, Kingston, ON, Canada
- European Union Fellowship for Education Abroad** **Sept. 2003 – June 2004**  
 School of Computing, Dublin City University, Ireland

## CONFERENCE PUBLICATIONS, PEER-REVIEWED

- **Francisco Servant**, James A. Jones, *“Fuzzy Fine-grained Code-history Analysis”*. Proceedings of the 39th International Conference on Software Engineering (ICSE 2017), Buenos Aires, Argentina, May 2017, pp. 746–757. **Acceptance Rate: 16%**
- **Francisco Servant**, *“Supporting Bug Investigation using History Analysis”*. Proceedings of the 28th IEEE/ACM International Conference on Automated Software Engineering, Doctoral Symposium Track (ASE 2013), Silicon Valley, California, November 2013, pp. 754-757.
- **Francisco Servant**, James A. Jones, *“Chronos: Visualizing Slices of Source-Code History”*. Proceedings of the 1st IEEE International Working Conference on Software Visualization, Tool Track (VISSOFT 2013), Eindhoven, Netherlands, September 2013, pp. 1-4.

- **Francisco Servant**, James A. Jones, *"History Slicing: Assisting Code-Evolution Tasks"*. Proceedings of the 20th International Symposium on Foundations of Software Engineering (FSE 2012), Research Triangle Park, NC, USA, November 2012, pp. 43:1-43:11. **Acceptance Rate: 16.9%**
- **Francisco Servant**, James A. Jones, *"WhoseFault: Automatic Developer-to-Fault Assignment Through Fault-Localization"*. Proceedings of the 34th International Conference on Software Engineering (ICSE 2012), Zurich, Switzerland, June 2012, pp. 36-46. **Acceptance Rate: 21%**
- **Francisco Servant**, James A. Jones, *"History Slicing"*. Proceedings of the 26th IEEE/ACM International Conference on Automated Software Engineering (ASE 2011), Lawrence, Kansas, USA, November 2011, pp. 452-455. **Acceptance Rate: 37%**

#### WORKSHOP PUBLICATIONS, PEER-REVIEWED

- **Francisco Servant**, James A. Jones, André van der Hoek, *"CASI: Preventing Indirect Conflicts through a Live Visualization"*. Proceedings of the International Workshop on Cooperative and Human Aspects of Software Engineering (CHASE 2010), Cape Town, South Africa, May 2010, pp. 39-46.

#### OTHER PUBLICATIONS

- **Francisco Servant**, *"A Characterization and Partial Automation of the Multi-revision, Fine-grained Analysis of Code History as an Efficient and Accurate Mechanism to Support Software Development"*. Ph.D. Thesis. University of California, Irvine. June 2015.
- **Francisco Servant**, *"Spheres of Influence: Enhancing Support of Indirect Conflicts through Workspace Awareness"*. M.S. Thesis. University of California, Irvine. August 2009.
- **Francisco Servant**, Jose Javier Moreno, *"Snap: A Dental Prints Recognition System"*. B.S. Thesis. University of Granada, Spain. December 2005.

#### POSTERS

- **Francisco Servant**, *"Supporting Bug Investigation using History Analysis"*. International Conference on Automated Software Engineering (ASE 2013), Silicon Valley, California, November 2013.
- **Francisco Servant**, James A. Jones, *"Chronos: Visualizing Slices of Source-Code History"*. Working Conference on Software Visualization (VISSOFT 2013), Eindhoven, Netherlands, September 2013.
- **Francisco Servant**, James A. Jones, *"History Slicing"*. International Conference on Automated Software Engineering (ASE 2011), Lawrence, Kansas, USA, November 2011.
- Tiago Proença, **Francisco Servant**, Nilmax Moura, André van der Hoek. *"Lighthouse - A Coordination Platform Based on Emerging Design"*. ISR Research Forum 2009, Irvine, California, USA, June 2009.

#### CONFERENCE PRESENTATIONS

- *"Supporting Bug Investigation using History Analysis"*. International Conference on Automated Software Engineering, Doctoral Symposium Track (ASE 2013), Silicon Valley, California, November 2013.
- *"Chronos: Visualizing Slices of Source-Code History"*. Working Conference on Software Visualization, Tool Track (VISSOFT 2013), Eindhoven, Netherlands, September 2013.
- *"History Slicing: Assisting Code-Evolution Tasks"*. International Symposium on Foundations of Software Engineering (FSE 2012), Research Triangle Park, NC, USA, November 2012.

- *“WhoseFault: Automatic Developer-to-Fault Assignment Through Fault-Localization”*. International Conference on Software Engineering (ICSE 2012), Zurich, Switzerland, June 2012.
- *“History Slicing”*. International Conference on Automated Software Engineering (ASE 2011), Lawrence, Kansas, USA, November 2011.
- *“CASI: Preventing Indirect Conflicts through a Live Visualization”*. Workshop on Cooperative and Human Aspects of Software Engineering (CHASE 2010), Cape Town, South Africa, May 2010.

#### INVITED PRESENTATIONS

- *“Supporting Software Development through Code History Analysis”*. Computer Science Graduate Seminar. Virginia Commonwealth University (VCU), Virginia, USA, October 2016.
- *“Improving Software Development through Data Analytics”*. Center for the Enhancement of Engineering Diversity (CEED) Seminar. Virginia Tech, Virginia, USA, September 2016.
- *“Automatic Software Development Support”*. Graduate Recruitment Seminar. Virginia Tech, Virginia, USA, March 2016.
- *“Supporting Software Development through Code History Analysis”*. Computer Science Graduate Seminar. Virginia Tech, Virginia, USA, February 2016.
- *“Understanding Bugs through Code-history Analysis”*. ISR Research Forum, Irvine, California, USA, May 2014.
- *“Supporting Bug Investigation using History Analysis”*. Universidad de Sevilla, Spain. December 2013.
- *“History Slicing: Assisting Code-Evolution Tasks”*. Universidad Rey Juan Carlos, Madrid, Spain. October 2013.
- *“Un futuro de oportunidades”*. CITIC-UGR Research Center, Granada, Spain, October 2013.
- *“Supporting Code-Evolution Tasks with Code History”*. ISR Research Forum, Irvine, California, USA, May 2013.
- *“History Slicing”*. ISR Research Forum, Irvine, California, USA, May 2012.
- *“BranchMon: A Branch Analytics Tool”*. Microsoft Research, Redmond, Washington, USA, September 2011.
- *“Automatic Developer-to-Failure Assignment”*. Microsoft Research, Redmond, Washington, USA, July 2011.
- *“Lighthouse - A Coordination Platform Based on Emerging Design”*. ISR Research Forum, Irvine, California, USA, June 2009.
- *“Snap: A Dental Prints Recognition System”*. Microsoft Corporation, Madrid, Spain, January 2006.

#### TEACHING EXPERIENCE

- CS 6704: Software Engineering Analytics and Automation. Principal Instructor. Virginia Tech. Fall 2016.
- CS 3704: Intermediate Software Design and Engineering. Principal Instructor. Virginia Tech. Spring 2016.
- CS 5704: Software Engineering. Principal Instructor. Virginia Tech. Fall 2015.
- Software Analysis and Testing. Guest Lecture: *“Continuous Integration and Delivery”*, University of California, Irvine. Spring 2015.

- Software Testing, Analysis, and Quality Assurance. Guest Lecture: “Continuous Delivery”, University of California, Irvine. Fall 2014.
- Software Analysis and Testing. Guest Lecture: “Continuous Integration”, University of California, Irvine. Spring 2014.
- Informatics Research Topics. Teaching Assistant, University of California, Irvine. Spring 2012.
- Software Testing and Quality Assurance. Teaching Assistant, University of California, Irvine. Spring 2012.
- Informatics Core II. Teaching Assistant, University of California, Irvine. Winter 2012.
- Senior Design Project. Teaching Assistant, University of California, Irvine. Winter 2012.
- Requirements Analysis & Engineering. Teaching Assistant, University of California, Irvine. Fall 2011.
- Senior Design Project. Teaching Assistant, University of California, Irvine. Fall 2011.
- Software Analysis and Testing. Guest Lecture: “Automatic Expertise Identification”, University of California, Irvine. Fall 2011.

#### STUDENTS

- Frank Lykes Claytor (2017). M.S. advisor.
- Khadijah Al Safwan (2016-2017). M.S. advisor.
- Soumik Ghosh (2016-2017). Research advisor.
- Andrej Galad (2017). Research advisor.
- Mukund Rajagopal (2017). M.S. committee member.
- Nischel Kandru (2017). M.S. committee member.
- Da Pu (2016-2017). M.S. committee member.
- Peeratham Techapalokul (2017). Ph.D. committee member.
- Bharti Wadhwa (2015-2017). Ph.D. committee member.
- Bob Edmison (2016-2017). Ph.D. committee member.
- Ayaan Kazerouni (2017). Ph.D. committee member.

#### PAST STUDENTS

- Madhusudan Srinivasan (2017). Ph.D. advisor.
- Zahra Ghaed (2016-2017). M.S. Thesis committee member.
- Jing Pu (2016). M.S. Thesis committee member (Graduated. Currently at Invexer Technology, Inc.)
- Arinjoy Basak (2016-2017). Research advisor.
- Saurabh Chakravarty (2016). M.S. advisor.
- Luke Gusukuma (2016). Research advisor.

- Mai Dahshan (2016). Ph.D. Thesis committee member.
- Jeremy Anoc (2012-2013). Undergraduate research advisor.

#### EXTERNAL SERVICE

- Reviewer, IEEE Transactions on Software Engineering Journal (TSE), 2016-2017.
- Reviewer, Journal of Internet Services and Applications (JISA), 2015.
- Reviewer, Journal of Systems and Software (JSS), 2015.
- External reviewer, International Symposium on the Foundations of Software Engineering (FSE), 2014.
- External reviewer, International Conference on Software Engineering (ICSE), 2014.
- Reviewer, Central European Journal of Computer Science (CEJCS), 2013.
- External reviewer, International Conference on Software Engineering (ICSE), 2013.
- External reviewer, Working Conference on Software Visualization, Tool Track (VISSOFT), 2013.
- External reviewer, Working Conference on Software Visualization, NIER Track (VISSOFT), 2013.
- PC member, International Conference on Program Comprehension (ICPC), Tool-Demonstration Track, 2012.
- PC member, International Working Conference on Mining Software Repositories (MSR), Mining Challenge Track, 2012.
- External reviewer, International Conference on Software Engineering (ICSE), 2012.

#### INTERNAL SERVICE

- Committee member, Graduate admissions at the Computer Science department at Virginia Tech, 2017-2018.
- Committee member, Hispanic Caucus at Virginia Tech, 2015-2017.
- Organizer, Systems reading group seminar, Fall 2016.

#### AWARDS

- Professional Development Award for Hispanic/Latino Faculty, 2016
- Virginia Tech Provost's Mentoring Project Award, 2016
- NSF Travel Award for ICSE 2016
- NSF Travel Award for VISSOFT 2013
- SIGSOFT-CAPS Travel Award for ICSE 2012
- Dean's Fellowship, Donald Bren School of Information and Computer Sciences, 2009 – 2013
- Caja Madrid Foundation Fellowship for Graduate Studies, 2007 – 2009

#### PROGRAMMING LANGUAGES

Java, C#, C, C++, SQL, Python, Perl, Visual Basic, Prolog, LISP

## SOFTWARE PROJECTS

- Chronos: Code History Analysis tool for obtaining and exploring the history of any set of source code lines.
- History Slicing: Framework to model and analyze the history of source code at the line-of-code granularity.
- WhoseFault: Tool for recommending a ranked list of the most suited developers for fixing a bug.
- CASI: Eclipse plug-in to warn developers of potential indirect conflicts in real-time.
- Lighthouse: Eclipse plug-in that provides a live visualization of the *emerging design* of the source code.
- Snap: Dental prints recognition system that matches 3D dentition models with 2D wound images.

## LANGUAGES

Spanish (native), English (fluent), French (basic)

## PROFESSIONAL AFFILIATIONS

- |  |                |
|--|----------------|
| • Institute of Electrical and Electronics Engineers (IEEE)         | 2013 – Present |
| • IEEE Computer Society  | 2013 – Present |
| • Association for Computing Machinery (ACM)                        | 2010 – Present |
| • ACM Special Interest Group on Software Engineering (ACM SIGSOFT) | 2010 – Present |
| • Institute for Software Research at UC Irvine (ISR)               | 2007 – Present |

## REFERENCES

References available upon request