The University of Memphis
Systems Testing Excellence Program
FedEx Institute of Technology

10th International Research Workshop on Advances and Innovations in Software Testing

The workshop is organized by the Systems Testing Excellence Program - STEP (www.memphis.edu/step) at the University of Memphis. STEP is an interdisciplinary research program under the auspices of the FedEx Institute of Technology that brings together the Departments of Business Information & Technology, Computer Science, and Computer Engineering.

May 1-2, 2017
Memphis, Tennessee
Welcome to the 10th International Research Workshop on Advances and Innovations in Software Testing

On behalf of the Workshop organizing committee, I extend a warm welcome to you to the tenth annual International Research Workshop on Advances and Innovations in Software Testing, sponsored by the Systems Testing Excellence Program (STEP) and FedEx Institute of Technology (FIT) of the University of Memphis.

The members of the organizing committee have worked hard over the last few months to put together a great agenda for the workshop. I sincerely hope that you will go back with some bright ideas to enhance your software testing activity after interactions with experts in the field. We have tried to mingle academic researchers with industry practitioners through paper presentations, invited talks, and panel discussions. I urge you to fully participate and be as engaging as possible to make the workshop worthwhile. We also welcome your comments and suggestions to make the workshop more pertinent to your work in software testing.

STEP is a collaborative effort of BIT, CS and EECE departments of the University of Memphis. The workshop is also supported by FedEx’s Global Testing Center of Excellence, which has a unique research and training partnership relationship with STEP. It is a pleasure to acknowledge the sponsorships of FedEx, Syntel, and ASTQB.

Memphis, with its booming growth in Bio and Information technologies, houses premier organizations such as FedEx, AutoZone, St. Jude Children’s Research Hospital, International Paper, and several biotechnology research institutions. It is also soaked in the rich traditions of Blues and Rock ‘n’ Roll and world-renown barbeque, while housing the Graceland Mansion of Elvis Presley, National Civil Rights Museum, and such. If you are new to Memphis, I urge you to spend an extra day or two soaking in Memphis culture!

Thank you for joining us. Let us move Software Testing to new heights of excellence!

Sajjan G. Shiva, Ph.D., Workshop General Chair
Monday, May 1, 2017
Opening Reception

All sessions are in Methodist Presentation Theatre on the first floor of FIT. All breaks will be in the lobby of FIT.

7:00 – 17:00.................................Registration Open (FIT Lobby)

7:00 – 8:00.................................................................Breakfast

8:00 – 8:05.................................................................Welcome

Sajjan Shiva
Professor, Department of Computer Science
University of Memphis

8:05 – 8:15......................................................Opening Comments

Jasbir Dhaliwal
Vice Provost for Academics & Dean of Graduate School
University of Memphis
Co-Founder of STEP

Dave Miller
VP IT FedEx Services (Retired) and Owner of Miller Mentoring and Consulting
Co-Founder of STEP

8:15 – 8:30 ...............................................................STEP Address

Robin Poston
Director of STEP
Department Chair of Business Information & Tecnology (BIT)

Anne Sparrenberger
FedEx Corporation, Vice President
STEP Industry Partner and Advisor

8:30 – 9:30 .................................................................Keynote Address

Dr. Steve Hutchison
Director of Capability Development Support Group
Department of Homeland Security

9:30 – 9:45 .......................................................... ISTQB Partnership

Yaron Tsubery, Ritendra Banerjee, & Dani Almog
International Software Testing Qualifications Board (ISTQB) and STEP

9:45 – 9:50 ........................................10 Years of STEP Training

Dr. Mark Gillenson
Associate Director of STEP

9:50 – 10:10 .................................................................Break

10:10 – 11:10 ................................................ Paper Session 1

Session Chair: Xihui “Paul” Zhang

Mark Gillenson, Yao Shi, Xihui “Paul” Zhang, Thomas Stafford: Unit Value of a Test Case: An Update

Jong Seok Lee: The Practical Value of Agile Development

Jignya Patel, Robin Poston, Yelyzaveta Tymchenko: How Testers Support Project Managers Using Agile in a Traditional Organization

11:10 – 11:25 .................................................................Invited Talk

Continuous Testing - The New Normal
Tom Wissink
Intervise Director of System and Software Integration and Test
11:25 – 11:40 .......................................................... Industry Talk 1

Dev Ops (Continuous Integration / Continuous Delivery)
Abhijit Deshpande
Syntel

11:40 – 11:55 .......................................................... Industry Talk 2

Advancing the Testing Profession
Tauhida Parveen
American Software Testing Qualifications Board (ASTQB)

11:55 – 12:10 .............................................. ISSRE Announcement

Bojan Cukic & Ram Chillarege
International Symposium on Software Reliability Engineering

12:10 – 13:10 .............................................................. Lunch Break

FIT tour (optional), meet at 12:40

13:10–14:10 .............................................................. Panel 1

Panel 1: Testing in the Era of Agile Development

Panel Chair: Jong Lee, University of Memphis

Panelists:
Chandy Littlejohn, IT Manager, Hilton
Joel Neely, Technical Fellow, FedEx Services
Dan Petit, Director, Service Master
Andy Pittman, IT Manager, FedEx Services

14:10 – 15:10 .......................................................... Paper Session 2

Session Chair: Ted Lee

Naveen Kumar, Deepak Venugopal, and Robin Poston: Testing and Design Science

Dani Almog: The Effect of Continues Integration (CI) and Continues deployment (CD) on Testing and Quality

Rodrigo Silva-Lugo and Sajjan Shiva: Software Test Case Selection Optimization Using Generic Algorithm

15:10 – 15:30 .......................................................................... Break

15:30 – 16:30 ....................................................................... Panel 2

Panel 2: Managing Intragroup Relationships in a Development Organization

Panel Chair: Rob Stalder, University of Memphis

Panelists:
Sandy Cobb, IT Director, FedEx Services
Peter Lutrick, Solutions Engineer, International Paper
Brent Nair, Chief Information Officer, City of Memphis
Joel Tracy, Chief Information Officer, IMC Companies

16:30 – 16:40 .................................................... Closing Comments

Mark Gillenson
Associate Director of STEP
Professor of Business Information & Technology

18:00 – 20:00 .................................................................... Dinner at

Bosco’s Memphis
2120 Madison Ave
Memphis, TN 38104
(901) 432-2222

(Need a ride? Meet in FIT Lobby at 17:30)
Tuesday, May 2, 2017
Tutorials on Advanced Testing

All sessions are in the 2nd Floor of the FIT (The Fishbowl, Room 226 and 227)

Concurrent Tutorial Sessions

8:30 – 9:00 ............................................ Light Breakfast, 2nd Floor

9:00– 11:30 ................................................... Tutorial 1: Fishbowl

People and cultural challenges in agile development and testing – Jong Lee, University of Memphis

A recent line of agile research has uncovered several people and cultural challenges that arise and can become obstacles in agile development and testing. Such challenges include the need for broader skill sets, increased reliance on social skills, building culture of trust, devolved decision making in agile software development teams, distinct mindsets of developers vs. testers, embracing agile principles, and managing behavioral changes. This tutorial will review the findings of the latest research with respect to these challenges and offer practical implications for how to deal with them. Further, this tutorial will present a change management framework called “switch” which is built on decades of research on organizational and behavioral change management.

9:00– 11:30 .................................................. Tutorial 2: Room 226

Can we inject testability into IOT design – Dani Almog, Shamoon College of Engineering

IoT has become one of the most popular trends in SW development. All around us, people are teaching the architectural, principle and application aspects. A new trend keeps popping up; among them is Microservices. Are we ready to develop microservices and test them? What tools and measures should we have to evaluate the quality of IOT world? Design for testability is the focus of this session. We’ll introduce, describe, and discuss principles, elements and processes derived from this new technology. Have you heard of Containers & Dockers? The workshop will conclude by explaining and demonstrating the application of containers which include its application and dependencies, sharing the kernel with other containers. Containers can use a Docker, which is not tied to any specific infrastructure: they run on any computer, on any infrastructure, and in any cloud. The session will present most modern and updated tools and discuss infrastructure for assuring the quality of IoT.

9:00 – 11:30 .................................................. Tutorial 3: Room 227

Machine Learning Techniques and their Applications in Software Testing - Deepak Venugopal, University of Memphis

With an exponential growth in data over the last few years, it has become increasingly important to utilize automated tools and techniques from Machine learning in order to fully exploit the data for making informed decisions. In this tutorial, I will introduce basic techniques in Machine Learning and also how these techniques could be applied to make software testing more reliable and effective. Specifically, I will present concepts and techniques from supervised and unsupervised classification methods and relate these techniques to commonly encountered tasks in testing such as selecting the appropriate test-cases, predicting the likelihood of errors, automatically analyzing defect reports, etc. I will also present a popular and easy-to-use machine learning package called WEKA that has implementations of several well-known machine learning algorithms.

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