

## Muhammad Imran

Qatar Computing Research Institute

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### RESEARCH INTERESTS

I am interested in understanding the role of Social Media during mass convergence events by using big data analysis techniques such as text classification, data mining, and interactive machine learning, and to use social media data streams to develop novel solutions and technologies to help stakeholders gain situation awareness and to improve their decision making processes.

**Keywords:** *Social Computing, Crisis Informatics, Crowdsourcing, Web Engineering*

### EDUCATION

#### Ph.D. Computer Science

November 2009 – March 2013

University of Trento, Trento, Italy.

Concentration: Computer Science

#### M.Sc. Computer Science

September 2005 – September 2007

Mohammad Ali Jinnah University, Islamabad, Pakistan.

Concentration: Computer Science

#### B.S. Computer Science

January 2000 – December 2003

Allama Iqbal Open University, Islamabad, Pakistan.

Concentration: Computer Science

### HONORS & AWARDS

- **Best Paper Award:** at the 10th International Conference on Information Systems for Crisis Response and Management (ISCRAM) in 2013, Baden-Baden, Germany.

- **Recipient of Scholarship:** from the University of Trento for PhD studies (2009-2013).

- **Distinguished Position:** achieved 1st place in Master of Science (Computer Science) in 2007.

### SELECTED PUBLICATIONS

1. Muhammad Imran, Carlos Castillo, Fernando Diaz, Sarah Vieweg: Processing Social Media Messages in Mass Emergency: A Survey. *ACM Computing Surveys*. 47, 4, Article 67 (June 2015), 38 pages. DOI=10.1145/2771588 <http://doi.acm.org/10.1145/2771588>
2. Muhammad Imran, Carlos Castillo. Towards a Data-driven Approach to Identify Crisis-Related Topics in Social Media Streams. *Social Web for Disaster Management (SWDM) at the 24th International Conference on World Wide Web (WWW)*, 2015. Italy.
3. Muhammad Imran, Carlos Castillo, Ji Lucas, Patrick Meier, and Jakob Rogstadius. Coordinating Human and Machine Intelligence to Classify Microblog Communications in Crises. *11th International Conference on Information Systems for Crisis Response and Management*, 2014. Pennsylvania, USA.
4. Muhammad Imran, Carlos Castillo, Ji Lucas, Patrick Meier, and Sarah Vieweg. AIDR: Artificial Intelligence for Disaster Response. *23th International Conference on World Wide Web (WWW)*, 2014, Seoul, Korea.

5. Muhammad Imran and Carlos Castillo. Volunteer-powered Automatic Classification of Social Media Messages for Public Health in AIDR. *Public Health in the Digital Age workshop in the 23th International Conference on World Wide Web (WWW)*, 2014, Seoul, Korea.
6. Sarah Vieweg, Carlos Castillo and Muhammad Imran. Integrating Social Media Communications into the Rapid Assessment of Sudden Onset Disasters. *6th International Conference on Social Informatics (SocInfo)*, 2014.
7. Muhammad Imran, Shady Elbassuoni, Carlos Castillo, Fernando Diaz and Patrick Meier. Extracting Information Nuggets from Disaster-Related Messages in Social Media. *10th International Conference on Information Systems for Crisis Response and Management (ISCRAM)*, May 2013, Baden-Baden, Germany.
8. Muhammad Imran, Shady Elbassuoni, Carlos Castillo, Fernando Diaz and Patrick Meier. Practical Extraction of Disaster-Relevant Information from Social Media. *Social Web for Disaster Management (SWDM) at the 22th International Conference on World Wide Web (WWW)*, 2013, Rio de Janeiro, Brazil.
9. Muhammad Moeen Uddin, Muhammad Imran, and Hassan Sajjad. Understanding Types of Users on Twitter. To appear in *SocialCom-Standford 2014*, May 2014, CA, USA.
10. Soudip Roy Chowdhury, Muhammad Imran, Muhammad Rizwan Asghar, Si-hem Amer-Yahia and Carlos Castillo. Tweet4act: Using Incident-Specific Profiles for Classifying Crisis-Related Messages. *10th International Conference on Information Systems for Crisis Response and Management (ISCRAM)*, May 2013, Baden-Baden, Germany.
11. Muhammad Imran, Syed Zeeshan Haider Gillani and Maurizio Marchese. A Real-time Heuristic-based Unsupervised Method for Name Disambiguation in Digital Libraries. *2nd Workshop on Mining Scientific Publications at the Joint Conferences on Digital Libraries (JCDL)*, July 2013, Indianapolis, USA.
12. Muhammad Imran, Stefano Soi, Felix Kling, Florian Daniel, Fabio Casati and Maurizio Marchese. On the Systematic Development of Domain-Specific Mashup Tools for End-Users. *International Conference on Web Engineering (ICWE)*, July 2012, Berlin, Germany.
13. Florian Daniel, Muhammad Imran, Stefano Soi, Antonella De Angeli, Christopher R. Wilkinson, Fabio Casati and Maurizio Marchese. Developing Mashup Tools for End-Users: On the Importance of the Application Domain. *International Journal of Next-Generation Computing (IJNGC)*, 2012.
14. Muhammad Imran, Felix Kling, Stefano Soi, Florian Daniel, Fabio Casati and Maurizio Marchese. ResEval Mash: A Mashup Tool for Advanced Research Evaluation. *21th International Conference on World Wide Web (WWW)*, 2012, France, Lyon.
15. Muhammad Imran, Florian Daniel, Fabio Casati, Maurizio Marchese. ResEval Mash: A Mashup Tool that Speaks the Language of the User. *ACM CHI Conference on Human Factors in Computing Systems (CHI)*, 2012, Austin, USA.

(Full publications list at <http://mimran.me/publications>)

## RESEARCH EXPERIENCE

### Scientist

December 2014 – Present

Qatar Computing Research Institute, Doha, Qatar

Responsibilities: Focusing on building computational methods and technologies for real-time mining of social media data streams such as Twitter data stream using hybrid approaches. I study novel ways to combine humans and machines intelligence to solve non-trivial problems. Currently, interested in providing solutions and technologies to help stakeholders gain situational awareness and actionable information during mass convergence events using social media data.

### Post-doctoral Researcher

April 2013 – December 2014

Qatar Computing Research Institute, Doha, Qatar

Responsibilities: Conducted research on the application of Social Media mining methods to problems in the humanitarian crises. Humanitarian crisis computing seeks to rapidly identify situational awareness, actionable and tactical information in the big crisis data available on Social Media. Currently, leading research and technical directions of AIDR (Artificial Intelligence for Disaster Response) project. The focus of this applied research project is to use Social Media microblogging platforms like Twitter during mass convergence events and humanitarian crises in an effort to mine and classify information that can help stakeholders gain situation awareness and in their decision making processes.

### Research Associate

June 2012 – September 2012

Qatar Computing Research Institute, Doha, Qatar

Responsibilities: Mainly worked on two different research projects. The first project focused on real-time analysis of Social Media platforms such as Twitter, to predict life span of NEWS articles. Analysis of various parameters associated with articles like social media exposure in terms of their spread, first few hours visits, discussion was conducted using time-series analysis techniques. The second project focused on classification and extraction of useful information using machine learning techniques from disaster-related messages posted on Twitter to assist stakeholders in disaster response.

### PhD Candidate

November 2009 – March 2013

University of Trento, Trento, Italy

Responsibilities: Worked on the research direction of end-user development. EUD research tries to bring programming closer to the needs of end users. My PhD dissertation introduced the concept of Domain-Specific Mashups in which Web 2.0 technologies were employed to empower and enable non-programmers, non-technical users to develop ad-hoc and situational applications to perform complex data aggregation, processing and analysis tasks.

## TECHNICAL EXPERIENCE

### Database Administrator

July 2007 – August 2008

National University of Science & Technology (NUST), Islamabad, Pakistan

Responsibilities: I was responsible for the installation, configuration, upgrading, administration, monitoring, maintenance, and security of Oracle database systems. Moreover, performance tuning, query execution, tuning execution plans, were among other important responsibilities.

### Java Developer (Intern)

February 2009 – May 2009

OKKAM, Trento, Italy

Responsibilities: Assisted OKKAM research team to analyze big log files of different servers to investigate how complex operations execute and behave under different circumstances. For example, this includes checking how much time a search query

took to find an entity in the OKKAM entities database, or why certain part of a query failed.

**PROFESSIONAL - Track Co-chair:**

**ACTIVITIES**

- International Conference on Information Systems for Crisis Response and Management (ISCRAM 2015).

**- Program committee member:**

- International Conference on Digital Health (DL 2015).
- International Workshop on Social Web for Disaster Management (SWDM 2015).
- International Conference on Information Systems for Crisis Response and Management-Mediterranean (ISCRAM-Med 2014, 2015).
- Workshop on Standards and Practices in Large-Scale Social Media Research (2015).
- International Conference on Emerging Technologies (ICET 2014).
- Computational Social Science Winter Symposium (CSSWS 2014).

**- Reviewer:**

- Computer Networks Journal (2014).
- International Conference on Web Information System Engineering (WISE 2014).
- International Conference on Information Systems for Crisis Response and Management (ISCRAM 2014, 2015).
- ACM Web Science Conference (WebSci 2014).
- International Conference on Web Engineering (ICWE 2012).

**- Invited talks:**

- Machine Learning and Data Analytics Symposium (MLDA 2014).

**- Professional member:**

- Association for Computing Machinery (ACM) professional member (since 2012).
- ISCRAM community professional member (since 2012).

**TEACHING  
EXPERIENCE**

- Service-Oriented Architecture and Applications – course held by Prof. Maurizio Marchese at the University of Trento, 2010 – 2011.
- Laboratory for Service Design and Engineering – course held by Prof. Maurizio Marchese at the University of Trento, 2011 – 2012.

**MENTORING**

Following are the students that I co-mentored:

- Michele Lunelli (2010)
  - Level: Master (Laurea Magistrale) at the University of Trento
  - Co-mentor: Prof. Maurizio Marchese
  - Topic: Implementation of web crawlers for Google Scholar and Microsoft Academic to extract scholarly data and scholarly metrics (h-index, g-index).
- Felix Kling (2011)
  - Level: Master (Laurea Magistrale) at the University of Trento
  - Co-mentor: Prof. Maurizio Marchese
  - Topic: Implementation of the front-end of ResEval Mash project using JavaScript libraries.
- Massimo Pacher (2011)
  - Level: Master (Laurea Magistrale) at the University of Trento
  - Co-mentor: Prof. Fabio Casati

- Topic: Implementation of the scholarly metrics for group of people such as research groups at a university or a research lab.

- Simone Dalcastagne (2011)
  - Level: Master (Laurea Magistrale) at the University of Trento
  - Co-mentor: Prof. Fabio Casati
  - Topic: Implementation of self-citation count and other scholarly group metrics (e.g. group h-index).
- Matteo Bertoni (2013)
  - Level: Master (Laurea Magistrale) at the University of Trento
  - Co-mentor: Prof. Maurizio Marchese
  - Topic: Implementation of visualization components for the ResEval Mash project.

**CERTIFICATIONS** • **Oracle Certified Professional (OCP)**  
Track: Database Administration  
California, USA

**TECHNICAL  
SKILLS**

- **Programming:**
  - JAVA— SE, EE, EJBs (expert level)
  - Web Services (RESTFul, SOAP), Hibernate, SAX, JAXB (expert level)
  - Microsoft .NET Framework using C#, ASP.NET and ADO.Net (advance level)
  - Weka: Data Mining Software (advance level)
  - Python (beginner level)
- **Databases:**
  - Oracle 9i, 10g, 11g (expert level)
  - MySQL, MS-SQL Server (advance level)
  - Redis (expert level)
- **Misc. expertise:**
  - Good hands on knowledge of OOP (Object Oriented Programming) and agile methodology.
  - Experience designing and/or developing solutions for a Service Oriented Architecture (SOA).
  - Sound knowledge of 3-tier and N-tier layered architecture, and design patterns like Singleton, Factory and MVC.
  - Experience using tools such as NetBeans, Eclipse, Visual Studio.Net.
  - Experience using technologies such as Maven, BaseCamp, Pivotal Tracker, GIT.

**REFERENCES**    References available upon request.