Joydeep Mitra

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# Education

**PhD** Kansas State University,   
Computer Science Aug 2020  
Dissertation: **A development methodology to help build secure mobile apps**(<https://krex.k-state.edu/dspace/handle/2097/40747)>

**BS** West Bengal University of Technology,   
Information Technology Jun 2010

# Honors and Awards

**Ann and Dave Braun Student Inventor Award, Kansas State University** 2019

Awarded to a student in the university annually for an innovation with  
commercial potential

**Android Security Rewards, Google Inc.** 2018

Awarded for discovering two vulnerabilities affecting Android 7 thru Android 9   
(CVE-2018-9548, CVE-2019-9463).

**Kansas State Engineering Fellowship, Kansas State University** 2014-2016

Awarded to select incoming PhD students

# Experience

**Assistant Professor of Practice, Stony Brook University** 2020-Present

**Research Assistant** 2016-2018

* Ghera – A repository of Android app vulnerability benchmarks:   
  <https://bitbucket.org/secure-it-i/android-app-vulnerability-benchmarks>
* Rekha – An empirical evaluation of freely available security analysis tools in Android. <https://bitbucket.org/secure-it-i/may2018/src>

**Google Summer of Code** Summer 2017

**Intern**, MIT App Inventor

* Helped design and implement CloudDB for developers of App Inventor. <https://github.com/JoyMitra/appinventor-sources/blob/joy_dev/My_GSOC_Contribution.md>Skill/Accomplishment/Project

**Cognizant Technology Solutions**, India 2010 - 2014

**Programmer Analyst**

* Helped develop and maintain the payment management system for insurance companies like MetLife and John Hancock

# Teaching Experience

**Kansas State University** 2014 - 2020

* Course Assisted:
  + Logical Foundations of Programming
  + Software Testing Techniques with Python
  + Introduction to Software Security
  + Programming Languages Design & Implementation
* Responsibilities:
  + Help sessions to assist students with the material
  + Help designing course material
  + Grading and designing assignments and exams

**Kansas State University** 2020 - Present

* Course Taught:
  + Scripting Languages
  + System Fundamentals
* Responsibilities:
  + Design course materials and syllabus
  + Teach lectures
  + Grading and designing assignments and exams

# Publications

## Journal Publications

Venkatesh-Prasad Ranganath and **Joydeep Mitra**, “Are Free Android App Security Analysis Tools Effective in Detecting Known Vulnerabilities?” *Empirical Software Engineering (EMSE), 2019.* *(Equal contribution)*

Nandini Sarkar, **Joydeep Mitra**, Molly Vittengl, Lexi Brandt and Christer B. Aakeröy, “A user-friendly application for predicting the outcome of co-crystallizations”. *CrystEngComm Journal, 2020*.

## Conference & Workshop Papers

(Peer-Reviewed)

**Joydeep Mitra** and Venkatesh-Prasad Ranganath, “Ghera: A Repository of Android App Vulnerabilities”. *International Conference on Predictive Models and Data Analytics in Software Engineering (PROMISE) 2017.*

**Joydeep Mitra** and Venkatesh-Prasad Ranganath, “[BenchPress: Analyzing Android App Vulnerability Benchmark Suites](https://arxiv.org/abs/1903.05170)”. *International Workshop on Advances in Mobile App Analysis (A-Mobile), 2019.*

**Joydeep Mitra** and Venkatesh-Prasad Ranganath, “[SeMA: A Design Methodology for Building Secure Android Apps](https://arxiv.org/abs/1902.10056)”. *International Workshop on Advances in Mobile App Analysis (A-Mobile), 2019.*

## arXiv preprints

**Joydeep Mitra** and Venkatesh-Prasad Ranganath, “SeMA: Extending and Analyzing Storyboards to Develop Secure Android Apps” *arXiv, 2020, eprint 2001.10052*

# Talks

Ghera: A Repository of Android App Vulnerabilities. *Midwest Verification Day (MVD), Manhattan, Kansas, 2017.*

Are Free Android App Security Analysis Tools Effective in Detecting Known Vulnerabilities? *International Conference on Automated Software Enginnering, San Diego, California, 2019.*

Analyzing Android App Vulnerability Benchmark Suites. *ASE Workshop on Advances in Mobile App Analysis, San Diego, California, 2019.*

A Design Methodology for Building Secure Android Apps. *ASE Workshop on Advances in Mobile App Analysis, San Diego, California, 2019.*

Using SeMA To Develop Secure Mobile Apps. *Languages Seminar at Stony Brook University, Stony Brook, New York, 2020*.

# Software built

**Ghera** Repository of Android app vulnerability benchmarks.

*Technologies*:Android & Java

*Impact*: Ghera helped discover two vulnerabilities in the Android platform  
 *Webpage*: <https://secure-it-i.bitbucket.io/ghera/index.html>

**Rekha** Tool-set to automatically evaluate Android security analysis tools.

*Technologies*: Android, Java, Groovy, R, Unix, Python

*Impact:* Used to evaluate 15 Android vulnerability detection tools

Webpage: <https://secure-it-i.bitbucket.io/rekha/index.html>

**SeMA** A Design Methodology to build secure Android apps

*Technologies*: Android, Java, Groovy, Storyboards

*Impact:* Used to prevent 49 vulnerabilities known to plague Android aps

Webpage: <https://bitbucket.org/secure-it-i/sema/src/master/>

**CloudDB** Library to help MIT App Inventor developers store data on an Internet connected database server (using Redis software).

*Technologies: Android, Java, Redis*

*Impact:* Used by MIT App Inventor developers

*Webpage*: <https://github.com/JoyMitra/appinventor-sources/tree/joy_dev>

**CoForm** Tool to help experimental chemists predict co-crystals.

*Technologies: Groovy, Unix, Cambridge Structural Database*

*Impact:* Ann and Dave Student Inventor Award for commercializing the tool.

*Note:* Protected by confidentiality agreement. Please email me for more information.

**SoFAnalyzer** Tool to identify security-related APIs used by Android app developers from discussions on Stack Overflow.

*Technologies:* Groovy, Unix, Android

*Webpage:* <https://bitbucket.org/secure-it-i/stackoverflow-march2019/src/master/>

**BenchPress** Tool-set to measure the representativeness of Android app security benchmark suites.

*Technologies*: Groovy, Unix, Android

*Note:* Please contact me for more information about the tool.

**BSE app** An Android app to aid veterinarians collect real-time data while examining bulls in the field.

*Technologies:* Android, Java

Webpage: <http://santoslab.github.io/apps-4-vet-med/bse/>

# Patents

Sarkar, Mitra, Aakeröy, et al. CoForm: *An Automated Technique for Predicting Co-crystals*. Patent Application filed April 2019. Patent Pending.

# Student Advising

2017-2018 Aditya Narkar, Masters’ student at Kansas State University.

Projects:

* *Testing the authenticity of Android app vulnerability benchmarks.*
* *Determining Android security-related APIs from Stack overflow discussions.*

Summer 2018 Catherine Mansfield, Undergraduate student at Kansas State University.

Project: *Detecting vulnerabilities in real-world Android apps.*

Spring 2019 Kayla Mesh, Undergraduate students at Kansas State University.

Project: *Verifying Cryptographic protocols using Maude-NPA.*

# References

Dr. Venkatesh-Prasad Ranganath

Google Inc.

Previously Asst. Professor, Kansas State University, USA.  
[venkateshprasad.ranganath@gmail.com](mailto:venkateshprasad.ranganath@gmail.com)

Dr. Christer Aakeröy

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