JOYDEEP MITRA

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New Computer Science, Room 131
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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.mdSkill/Accomplishment/Project

Cognizant Technology Solutions, India 2010 - 2014
Programmer Analyst

- Full Stack Development
- Helped develop and maintain the payment management system for insurance companies like MetLife and John Hancock

TEACHING EXPERIENCE

Stony Brook University 2020 - Present

- Course Taught:
  - Scripting Languages
  - System Fundamentals
  - Principle of Programming Languages
- Responsibilities:
  - Design course materials and syllabus
  - Teach lectures
  - Grading and designing assignments and exams
  - Manage teaching assistants

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

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". *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". *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.*

FOSSASIA Invited Talk on Securing Android Applications. Singapore, 2021.

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

2021 — Colin Ruan, Undergraduate at Stony Brook University
Jeffrey Jiminez, Undergraduate at Stony Brook University
- *Project: Analyzed COVID-19 Android apps for privacy violations*

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.*

SERVICE

- Reviewed poster submissions for Graduate Research Day at Stony Brook University

PROFESSIONAL DEVELOPMENT

- Professional Development Workshop for Teaching-Track Faculty (SIGCSE 2021)
- Essential Communication Skills Teaching (SUNY Professional Development)
- Designing Empirical Education Research Studies Workshop (DEERS 2021)

REFERENCES

Dr. Venkatesh-Prasad Ranganath
Google Inc.
Previously Asst. Professor, Kansas State University, USA.
venkateshprasad.ranganath@gmail.com

Dr. Christer Aakeröy
University Distinguished Professor, Kanas State University, USA.
aakeroy@ksu.edu

Dr. Torben Amtoft
Associate Professor, Kansas State University, USA.
tamtoft@ksu.edu

Dr. Robby
Professor, Kansas State University, USA.
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