

# Anirban Basu

RESEARCHER IN COMPUTATIONAL TRUST, PRIVACY AND SECURITY

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“There is only one corner of the universe you can be certain of improving, and that’s your own self.” – Aldous Huxley

## Summary

With more than a decade of research experience within both academia and industry, I have co-authored 70+ research papers and submitted about 20 co-authored Japanese patent applications. My publications have been cited more than 900 times setting my overall h-index to 15 (source: Google Scholar). My research is based on a user-centric view of privacy; and computational trust as an information security paradigm in an increasingly knowledge-based connected world. I like building things to solve real-world problems. Outside research and problem solving, I am keen on photography, videography and the associated travels.

## Professional experience

### KDDI Research (erstwhile KDDI R&D Laboratories)

Fujimino, Japan

SENIOR RESEARCHER

May. 2013 – present

- **Summary:** Conducting research within the scope of various government and privately funded projects in the Information Security Laboratory. KDDI Research is part of the KDDI Group that operates Japan’s second largest mobile network, au. My research topics include, but are not limited to: privacy preserving data mining, computational trust, consensus protocols and distributed ledgers, modelling privacy and privacy risks, and IoT applications.
- **Selected projects:** (a) A multi-institutional EUR 3M EU-Japan Horizon 2020 funded project to realise a secure data storage and privacy-preserving analytics engine over heterogeneous multi-cloud environments spanning across national borders; (b) a multi-institutional JPY 375M Japanese government project on applied security and privacy in big data; and (c) a Toyota ITC and KDDI Research jointly funded collaborative project with ISTI-CNR and the University of Pisa on privacy risks in trajectory data.

### Sole proprietorship

Tokyo, Japan

APPLICATION DEVELOPER AND CONSULTANT

Aug. 2014 – present

- **Summary:** Developing software, mobile games and providing technology consultancy. My main full-time position is with KDDI Research.
- **Selected project:** An application to help users ‘remember’ complex passwords: <http://pa55.github.io/pa55nyaps/>.

### Tokai University

Tokyo, Japan

POST-DOCTORAL RESEARCHER

Oct. 2010 – Mar. 2013

- **Highlights:** Developed a privacy-preserving collaborative filtering scheme over encrypted domain and demonstrated the feasibility in real-world public cloud environments – the Google App Engine and the Amazon Elastic Beanstalk – as part of a multi-institutional JPY 500M+ Japanese government funded project on privacy-preserving data mining on the cloud.

### University of Sussex

Brighton, UK

ASSOCIATE TUTOR (OCT. 2004 – JAN. 2010) AND RESEARCH FELLOW (OCT. 2008 – SEP. 2009)

Oct. 2004 – Jan. 2010

- **Highlights:** Re-developed a course module on electronic commerce technologies for the Masters degree programme funded by American Express. Worked in two (GBP 1M and GBP 1.4M) EPSRC funded research projects related to computational trust.

### Various organisations

Brighton, UK

TECHNOLOGY CONSULTANT (JUL. 2005 – SEP. 2008; JUN. 2010 – SEP. 2010)

Jul. 2005 – Sep. 2010

- **Highlights:** Technology consultant to the University of Sussex library. Developed Java Web Services hooks for Class Calendar Ltd. Co-developed computational skills training videos for Claro Training Ltd.

### University of Sussex

Brighton, UK

STEP SUMMER INTERN (JUL. 2003 – AUG. 2003) AND THEN RESEARCH ASSISTANT

Jul. 2003 – Sep. 2004

- **Highlights:** Developed a lightweight augmented reality based visualisation technology based on backend XML-based storage as part of a €2.8M EU Framework Programme V funded project on digital cultural heritage.
- **Award:** Shell Technology Enterprise Programme (STEP, UK) Local Finalist.

## Professional affiliations

### University of Sussex

Brighton, UK

VISITING RESEARCH FELLOW

Jan. 2010 – present

- Collaborative research with the Foundations of Software Systems (FoSS) group in the Department of Informatics.

### IFIP Trust Management (IFIPTM)

Tokyo, Japan

PUBLICITY CHAIR (JUN. 2010 – JUN. 2015) AND SECRETARY (JUN. 2015 – PRESENT)

Jun. 2010 – present

- Contributing to the IFIP Working Group 11.11 – Trust Management (IFIPTM), the premier venue on computational trust management research.

### Rutgers University

Newark, NJ, USA

VISITING RESEARCH FELLOW

Oct. 2014 – Sep. 2017

- Collaborative research with Prof. Jaideep Vaidya at the Rutgers Business School.

## Education

### University of Sussex

DOCTOR OF PHILOSOPHY (D.PHIL.) IN COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE

Brighton, UK

Oct. 2004 – Feb. 2010

- **Supervisors:** Prof. Ian Wakeman and Dr. Dan Chalmers.
- **Examiners:** Dr. Des Watson (University of Sussex) and Prof. David Parish (Loughborough University)
- **Doctoral thesis:** 'A Reputation Framework for Behavioural History' proposed a high-level, generalised, policy-independent and context-aware framework to build and share reputations of network clients based on their behavioural history in order to inform future interactions. PDF: <http://www.anirbanbasu.com/files/thesis-dphil2010.pdf>.

### University of Sussex

BACHELOR OF ENGINEERING (B.ENG.) IN COMPUTER SYSTEMS ENGINEERING

Brighton, UK

Oct. 2001 – Jun. 2004

- **Grade:** First Class Honours.
- **Awards:** (1) IEE Sussex Branch local prize for Outstanding Performance in Computer Systems Engineering (B.Eng.); and (2) the Eurotherm company prize for Best Electrical, Electronic or Computer Systems Engineering project.
- **Final year project:** 'ARCOLite – a visualisation system for viewing museum artefacts' presented a lightweight XML-based repository and a desktop visualisation in both virtual and augmented reality. PDF: <http://www.anirbanbasu.com/files/thesis-beng2004.pdf>.

## Accolades

### INVITED TALKS

- |      |  |                    |
|------|--|--------------------|
| 2017 | <b>IFIP TM – Doctoral Symposium</b> , Homomorphic Encryption – an answer to privacy?                 | Göteborg, Sweden   |
| 2015 | <b>Kyushu University – Next Generation Cryptography</b> , Homomorphic Encryption – are we there yet? | Fukuoka, Japan     |
| 2012 | <b>CSA – SecureCloud</b> , Practical privacy using homomorphic encryption – a myth or reality        | Frankfurt, Germany |

### AWARDS

- |      |   |              |
|------|---|--------------|
| 2004 | <b>IEE Sussex Branch local prize</b> , for Outstanding Performance in Computer Systems Engineering (B.Eng.) | Brighton, UK |
| 2004 | <b>Eurotherm company prize</b> , for Best Electrical, Electronic or Computer Systems Engineering project    | Brighton, UK |
| 2003 | <b>Local Finalist</b> , Shell Technology Enterprise Programme (STEP)  | Brighton, UK |

### SCHOLARSHIPS

- |      |   |              |
|------|---|--------------|
| 2004 | <b>Graduate Teaching Assistantship (2004–2007)</b> , Department of Informatics (University of Sussex) | Brighton, UK |
| 2001 | <b>Dean's Bursary (2001–2004)</b> , Department of Engineering and Design (University of Sussex)       | Brighton, UK |

## Publications

A full list of publications is available at: <http://www.anirbanbasu.com/#research>.

### Research papers

#### SELECTED PUBLICATIONS

- [1] K. Suksomboon, A. Tagami, **A. Basu**, and J. Kurihara, "IPRES: in-device proxy re-encryption service for secure ICN," in *Proceedings of the 4th ACM Conference on Information-Centric Networking (ICN)*. Berlin, Germany: ACM, 2017, pp. 176–177.
- [2] **A. Basu**, M. S. Rahman, R. Xu, K. Fukushima, and S. Kiyomoto, "VIgraph – A Framework for Verifiable Information," in *Proceedings of the IFIP WG 11.11 International Conference on Trust Management (IFIPTM)*, Göteborg, Sweden, 2017, pp. 12–20.
- [3] **A. Basu**, A. Monreale, R. Trasarti, J. C. Corena, F. Giannotti, D. Pedreschi, S. Kiyomoto, Y. Miyake, and T. Yanagihara, "A risk model for privacy in trajectory data," *Journal of Trust Management*, vol. 2, no. 1, pp. 1–23, 2015.
- [4] J. Vaidya, I. Yakut, and **A. Basu**, "Efficient Integrity Verification for Outsourced Collaborative Filtering," in *Proceedings of the IEEE International Conference on Data Mining (ICDM)*, Shenzhen, China, 2014.
- [5] **A. Basu**, J. Vaidya, H. Kikuchi, and T. Dimitrakos, "Privacy-preserving collaborative filtering on the cloud – practical implementation experiences," in *Proceedings of the IEEE Cloud*, Santa Clara, CA, USA, 2013.
- [6] **A. Basu**, S. Fleming, J. Stanier, S. Naicken, I. Wakeman, and V. K. Gurbani, "The state of peer-to-peer network simulators," *ACM Computing Surveys*, vol. 45, no. 4, pp. 46:1–46:25, 08 2013.
- [7] **A. Basu**, I. Wakeman, and D. Chalmers, "A Framework for Developing and Sharing Client Reputations," in *Proceedings of the IFIP WG 11.11 International Conference on Trust Management (IFIPTM)*, Morioka, Japan, 2010.

### Patents (including pending) and public information

#### JAPAN PATENT OFFICE APPLICATION NUMBERS

2013-141965, 2013-171600, 2013-202289, 2013-232080, 2013-272722, 2014-020802, 2014-054142, 2014-094155, 2014-149798, 2014-128201, 2014-177250, 2015-158205, 2015-046346, 2015-180642, 2016-066512, 2017-018877, 2017-018878, 2017-029170, 2017-029171, 2017-029172, 2017-099572, 2017-096380, 2017-198726, 2018-001096.

## Skills

### Computing skills

OS: MacOS, Windows, Linux, UNIX; *Documents*: MS Office, Google Docs and  $\LaTeX$ ; *Software development*: Java, C#, Objective-C, C++, Visual C++, C, Visual Basic, XML, Javascript, UML, Subversion, Git, JUnit, Ant, Maven, MySQL, JBoss, Tomcat, Google App Engine, Amazon Elastic Beanstalk. (**Non-exhaustive list.**)

### Languages

English (fluent), Bengali (native), Japanese (elementary), Hindi (elementary)