

ERMAN AYDAY

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Date of Birth: 03/14/1982

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EDUCATION

- 2005-2011 **Georgia Institute of Technology**, Atlanta, GA
Ph.D. in Electrical and Computer Engineering
Research Area: Cryptography and Network Security, Trust and Reputation Management
- 2005-2007 **Georgia Institute of Technology**, Atlanta, GA
M.S. in Electrical and Computer Engineering
Research Area: Cryptography, Network Security
- 2000-2005 **Middle East Technical University**, (METU) Ankara, Turkey
B.S. Electrical and Electronics Engineering

RESEARCH INTERESTS

- Privacy enhancing technologies (including big data and genomic privacy).
- Data security and applied cryptography.
- Big data analytics and statistical inference from big data.
- Iterative algorithms for trust and reputation management.
- Trust and reputation management for ad-hoc networks and online services.
- Information retrieval and recommender systems.
- Data privacy, authentication, and availability for wireless sensor networks.
- Game theory for wireless networks.
- Cyber security for smart grid, delay tolerant, and M2M networks.

RELATED EXPERIENCE

- Jan. 2015- **Department of Computer Engineering, Bilkent University, Turkey**
Assistant Professor.
- Jan. 2012-Jan. 2015 **Laboratory for Communications and Applications 1 (LCA1), Ecole Polytechnique
Fédérale de Lausanne (EPFL), Lausanne, Switzerland**
Post-Doctoral Researcher.

- Aug. 2005-Nov. 2011 **Georgia Tech Information Processing, Communications and Security Research Laboratory, Atlanta, GA, USA.**
Graduate Research Assistant.
- May 2010-Aug. 2010 **Samsung Telecommunications, Richardson, TX, USA.**
Internship at the Standards Engineering Group.
Cyber security solutions for the Smart Grid and M2M networks.
- May 2009-Aug. 2009 **Qualcomm, San Diego, CA, USA.**
Internship at Product Security Initiative.
L4 Microkernel and Iguana security/risk analysis, operating system security (particularly Symbian OS).
- Jan. 2009-May 2009 **T-Mobile Creation Center, Seattle, WA, USA.**
Technical Innovations Intern.
GSM security, anonymous routing in GSM networks, role of trust and reputation management in GSM networks.
- June 2004-July 2004 **ASELSAN, Ankara, Turkey.**
Summer Internship.

HONORS

- European Council Marie Skłodowska-Curie Individual Fellowship, 2016.
- IEEE Symposium on Security and Privacy (S&P) Best Paper Award, 2015.
- Researcher of the year award, EPFL, 2014.
- ECE Graduate Research Assistant (GRA) Excellence Award, School of Electrical and Computer Engineering, Georgia Institute of Technology, 2011.
- Outstanding Research Award from the Center of Signal and Image Processing (CSIP) at Georgia Tech, 2010.
- IEEE MILCOM Student Travel Grant, 2010.
- IEEE SECON Best Poster Award, 2007.
- Ranked 2nd in METU based on the graduation degree, 2005.
- Ranked 1st in METU Engineering School based on the graduation degree, 2005.
- Ranked 1st in METU Electrical Engineering Department based on the graduation degree, 2005.
- Achieved “Bulent Kerim Altay Award” 4 times in Electrical and Electronics Department at METU. (Given to students who achieve a GPA of 4.00/4.00 in a semester).
- Ranked 216th in university entrance examination in Turkey among 1.5 million students.

GRANTS

My work in Bilkent University is supported by the following grants:

- European Council H2020-MSCA-IF-2015 (707135), GenoPri: Quantifying and Protecting the Privacy of Genomic Data, 01/05/2016 – 01/05/2018
- TUBITAK 1003 (115E766), GENEMETRIC: Cloud Based Genetic Biometric Identification System, 01/02/2016 - 01/08/2018
- TUBITAK 2232 (1109B321500157), Robust and Privacy Preserving Decision Support Systems, 01/12/2015 - 01/10/2017

- Turk Telekom, Secure Data Publication, 01/12/2015 – 30/11/2016
- Turk Telekom, Private Data Sharing, 01/12/2015 – 30/11/2016
- Havelsan, Privacy-Preserving Processing of Electronic Health Records, 01/10/2016 – 01/10/2017
- STM Defense Technologies Engineering and Trade Inc., Data Fusion and Intrusion Detection for Heterogeneous Environments, 01/12/2016 – 01/06/2018

My work on genomic privacy is supported by the following grants:

- The Commission for Technology and Innovation (CTI) grant.
- Research fund from the health minister of Canton Vaud.
- Research fund from the University Hospital Lausanne (CHUV).
- Research fund from the Swiss HIV Cohort.

My work on reputation and recommender systems was supported by the following grants:

- US National Science Foundation Grant No. IIS-1115199.
- Cisco University Research Program Fund.

PUBLICATIONS (Google Scholar h-index: 15)

Journal Articles

1. **E. Ayday**, Q. Tang, and A. Yilmaz. “**Cryptographic Solutions for Credibility and Liability Issues of Genomic Data**”, to appear in *IEEE Transactions on Dependable and Secure Computing*, 2017.
2. **E. Ayday** and M. Humbert, “**Quantifying Interdependent Risks in Genomic Privacy**”, to appear in *IEEE Security and Privacy Magazine*, 2017.
3. I. Daznabi, M. Mobayen, N. Jafari, O. Tastan, and **E. Ayday**. “**An Inference Attack on Genomic Data Using Kinship, Complex Correlations, and Phenotype Information**”, to appear in *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 2017.
4. E. Yilmaz, **E. Ayday**, and H. Ferhatosmanoglu. “**Privacy-Preserving Aggregate Queries for Optimal Location Selection**”, to appear in *IEEE Transactions on Dependable and Secure Computing*, 2017.
5. M. Humbert, **E. Ayday**, A. Telenti, and J. P. Hubaux, “**Quantifying Interdependent Risks in Genomic Privacy**”, to appear in *ACM Transaction on Privacy and Security* (formerly known as TISSEC), 2016.
6. Z. Huang, **E. Ayday**, H. Lin, et al. “**A Privacy-Preserving Solution for Compressed Storage and Selective Retrieval of Genomic Data**”, to appear in *Genome Research*, 2016.
7. **E. Ayday**, Q. Tang, and A. Yilmaz. “**Cryptographic Solutions for Credibility and Liability Issues of Genomic Data**”, *Cryptology ePrint Archive*: Report 2016/478, May 2016.
8. P.-J. McLaren, J.-L. Raisaro, M. Aouri, M. Rotger, **E. Ayday** et al. “**Privacy-preserving genomic testing in the clinic - a model using HIV treatment**”, *Journal of Genetics in Medicine*, January 2016.
9. **E. Ayday**, E. De Cristofaro, G. Tsudik, and J. P. Hubaux. “**Whole Genome Sequencing: Revolutionary Medicine or Privacy Nightmare?**”, *IEEE Computer Magazine*, February 2015.
10. M. Naveed, **E. Ayday**, E. W. Clayton, J. Fellay, C. A. Gunter, J.-P. Hubaux, B. A. Malin, and X. Wang. “**Privacy in the Genomic Era**”, *ACM Computing Surveys*, Volume 48, No.1, August 2015. Also available at *arXiv: 1405.1891*, 2015.
11. A. Telenti, **E. Ayday**, and J.-P. Hubaux. “**On genomics, kin, and privacy**”, *F1000Research* 3:80 (doi: 10.12688/f1000research.4089), 2014.
12. J.L. Reisaro, **E. Ayday**, and J.-P. Hubaux, “**Patient Privacy in the Genomic Era**”, *PRAIX*, 7 May 2014.
13. **E. Ayday** and F. Fekri. “**An Iterative Algorithm for Trust Management and Adversary Detection for Delay Tolerant Networks**”, *IEEE Transactions on Mobile Computing*, Volume 11, No.9, September 2012.

14. **E. Ayday** and F. Fekri. “**A Secure Broadcasting Scheme to Provide Availability, Reliability and Authentication for Wireless Sensor Networks**”, *Elsevier Ad Hoc Networks*, Volume 10, No.7, September 2012, Pages 1278-1290.
15. **E. Ayday** and F. Fekri. “**Iterative Trust and Reputation Management Using Belief Propagation**”, *IEEE Transactions on Dependable and Secure Computing*, Volume 9, No.3 May/June 2012.
16. **E. Ayday**, F. Delgosha, and F. Fekri. “**Data Authenticity and Availability in Multi-hop Wireless Sensor Networks**”, *ACM Transactions on Sensor Networks*, Volume 8, Issue 2, March 2012.
17. **E. Ayday** and F. Fekri. “**A Protocol for Data Availability in Mobile Ad-Hoc Networks in the Presence of Insider attacks**”, *Elsevier Ad Hoc Networks*, Volume 8, Issue 2, March 2010, Pages 181-192.

Refereed Conference Papers

1. N. Salek, **E. Ayday**, and A. Guvenir. “**A Privacy-Preserving Solution for the Bipartite Ranking Problem**”, In Proceedings of *The 15th IEEE International Conference on Machine Learning and Applications (IEEE ICMLA'16)*, 2016.
2. V. Kucuk and **E. Ayday**. “**Profile Matching Across Unstructured Online Social Networks**”, In Proceedings of *International Workshop on Inference & Privacy in a Hyperconnected World* (collocated with SPW 2016), 2016.
3. E. Avllazagaj, **E. Ayday**, and E. Cicek. “**Privacy-Related Consequences of Turkish Citizen Database Leak**”, In Proceedings of *International Workshop on Inference & Privacy in a Hyperconnected World* (collocated with SPW 2016), 2016.
4. **E. Ayday**, “**Cryptographic Solutions for Genomic Privacy**”, In Proceedings of *International Conference on Financial Cryptography and Data Security (FC)*, 2016.
5. F. Tramèr, Z. Huang, **E. Ayday** and J.-P. Hubaux. “**Differential Privacy with Bounded Priors: Reconciling Utility and Privacy in Genome-Wide Association Studies**”, In Proceedings of *ACM Conference on Computer and Communications Security (CCS)*, 2015.
6. M. Alser, N. Almadhoun, A. Nouri, C. Alkan and **E. Ayday**. “**Can You Really Anonymize the Donors of Genomic Data in Today's Digital World?**”, In Proceedings of *Data Privacy Management (DPM) International Workshop (in conjunction with ESORICS)*, 2015.
7. F. Balci, H. Kulan, C. Alkan and **E. Ayday**. “**A New Inference Attack against Kin Genomic Privacy**”, in *Privacy-aware computational genomics (PRIVAGEN)*, 2015.
8. M. Alser, N. Almadhoun, A. Nouri, C. Alkan and **E. Ayday**. “**Identifying Anonymous Donors of Genetic Information**”, in *Privacy-aware computational genomics (PRIVAGEN)*, Tokyo, Japan, September 2015.
9. J. L. Raisaro, **E. Ayday**, P. McLaren, A. Telenti, and J. P. Hubaux, “**On a Novel Privacy-Preserving Framework for Both Personalized Medicine and Genetic Association Studies**”, in *Privacy-aware computational genomics (PRIVAGEN)*, 2015.
10. M. Humbert, K. Huguenin, J. Hugonot, **E. Ayday** and J.-P. Hubaux. “**De-anonymizing Genomic Databases using Phenotypic Traits**”, In Proceedings of *Privacy Enhancing Technologies Symposium (PETS)*, Philadelphia, PA, USA, Jun. 2015.
11. S. S. Samani, Z. Huang, **E. Ayday**, M. Elliot, J. Fellay, J.-P. Hubaux and Z. Kutalik, “**Quantifying Genomic Privacy via Inference Attack with High-Order SNV Correlations**”, In *Workshop on Genome Privacy (in conjunction with IEEE Symposium on Security and Privacy)*, San Jose, CA, USA, May 2015.
12. L. Barman, M.-T. Elgraini, J. L. Raisaro, **E. Ayday** and J.-P. Hubaux, “**Privacy Threats and Practical Solutions for Genetic Risk Tests**”, In *Workshop on Genome Privacy (in conjunction with IEEE Symposium on Security and Privacy)*, San Jose, CA, USA, May 2015.
13. Z. Huang, **E. Ayday**, J. P. Hubaux, J. Fellay, and A. Juels, “**GenoGuard: Protecting Genomic Data Against Brute-Force Attacks**”, In Proceedings of *IEEE Symposium on Security and Privacy*, San Jose, CA, USA, May 2015.
14. M. Humbert, **E. Ayday**, A. Telenti, and J. P. Hubaux, “**On Non-cooperative Genomic Privacy**”, In Proceedings of *19th International Conference on Financial Cryptography and Data Security (FC)*, Puerto Rico, USA, Jan. 2015.
15. M. Naveed, S. Agrawal, M. Prabhakaran, X. Wang, **E. Ayday**, J.-P. Hubaux and C.A. Gunter, “**Controlled Functional Encryption**”, In proceedings of *21st ACM Conference on Computer and Communications Security (CCS 2014)*, Scottsdale, AZ, USA, Nov. 2014.

16. M. Humbert, **E. Ayday**, A. Telenti, and J. P. Hubaux, “**Reconciling Utility with Privacy in Genomics**,” In Proceedings of *ACM Workshop on Privacy in the Electronic Society (WPES)*, Scottsdale, AZ, USA, Nov. 2014.
17. J.L. Raisaro, **E. Ayday**, P.J. McLaren, J-P. Hubaux, and A. Telenti, “**Privacy-Preserving HIV Pharmacogenetics: A Real Use Case of Genomic Data Protection**,” In *Workshop on Genome Privacy (in conjunction with PETS 2014)*, Amsterdam, Netherlands, July 2014.
18. **E. Ayday**, J. L. Raisaro, and J. P. Hubaux, “**Personal Use of the Genomic Data: Privacy vs. Storage Cost**,” In Proceedings of *IEEE Global Communications Conference, Exhibition and Industry Forum – GLOBECOM*, Atlanta, GA, Dec. 2013.
19. **E. Ayday**, J. L. Raisaro, J. Rougemont, and J. P. Hubaux, “**Protecting and Evaluating Genomic Privacy in Medical Tests and Personalized Medicine**,” In Proceedings of *ACM Workshop on Privacy in the Electronic Society (WPES)*, Berlin, Germany, Nov. 2013.
20. M. Humbert, **E. Ayday**, A. Telenti, and J. P. Hubaux, “**Responding to the Concerns of the Lacks Family: Quantification of Kin Genomic Privacy**,” In Proceedings of *20th ACM Conference on Computer and Communications Security (CCS)*, Berlin, Germany, Nov. 2013.
21. **E. Ayday**, J. L. Raisaro, U. Hengartner, A. Molyneaux, and J. P. Hubaux, “**Privacy-Preserving Processing of Raw Genomic Data**,” In Proceedings of *8th Data Privacy Management (DPM 2013) International Workshop (in conjunction with ESORICS)*, Egham, UK, Sep. 2013.
22. J. Zou, A. Einolghozati, **E. Ayday**, and F. Fekri, “**Iterative Similarity Inference via Message Passing in Factor Graphs for Collaborative Filtering**,” In proceedings of *IEEE Information Theory Workshop (ITW)*, Sevilla, Spain, Sep. 2013.
23. **E. Ayday**, J. L. Raisaro, and J. P. Hubaux, “**Privacy-Preserving Computation of Disease Risk by Using Genomic, Clinical, and Environmental Data**,” In proceedings of *USENIX Security Workshop on Health Information Technologies (HealthTech)*, Washington, DC, USA, Aug. 2013.
24. **E. Ayday**, J.L. Raisaro, and J.P. Hubaux, “**Privacy-Enhancing Technologies for Medical Tests Using Genomic Data** (short paper),” In *20th Annual Network & Distributed System Security Symposium – NDSS*, San Diego, CA, USA, Feb. 2013.
25. **E. Ayday**, J. Zou, A. Einolghozati, and F. Fekri, “**A Recommender System Based on Belief Propagation over Pairwise Markov Random Fields**,” In Proceedings of *50th Annual Allerton Conference on Communication, Control, and Computing (Allerton)*, Monticello, IL, USA, Oct. 2012.
26. **E. Ayday**, A. Einolghozati, and F. Fekri, “**BPRS: Belief Propagation Based Iterative Recommender System**,” In Proceedings of *IEEE International Symposium on Information Theory – ISIT*, Cambridge, MA, USA, Jul. 2012.
27. **E. Ayday** and F. Fekri, “**BP-P2P: A Belief Propagation-Based Trust and Reputation Management for P2P Networks**,” In Proceedings of *IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks – SECON*, Seoul, Korea, Jun. 2012.
28. **E. Ayday** and F. Fekri, “**Robust Reputation Management Using Probabilistic Message Passing**,” In Proceedings of *IEEE Global Communications Conference, Exhibition and Industry Forum – GLOBECOM*, Houston, TX, USA Dec. 2011
29. **E. Ayday** and F. Fekri, “**Application of Belief Propagation to Trust and Reputation Management**,” In Proceedings of *IEEE International Symposium on Information Theory – ISIT*, Saint Petersburg, Russia, Aug. 2011.
30. **E. Ayday** and S. Rajagopal, “**Secure, Intuitive and Low-Cost Device Authentication for Smart Grid Networks**,” In Proceedings of *IEEE Consumer Communications and Networking Conference - CCNS*, Las Vegas, NV, USA, Jan. 2011.
31. **E. Ayday** and F. Fekri, “**A Belief Propagation Based Recommender System for Online Services**,” In Proceedings of *ACM Recommender Systems*, Barcelona, Spain, Sep. 2010.
32. **E. Ayday**, H. Lee, and F. Fekri, “**Trust Management and Adversary Detection in Delay Tolerant Networks**,” In Proceedings of *IEEE Military Communications Conference - MILCOM*, San Jose, CA, USA, Nov. 2010.
33. **E. Ayday**, H. Lee, and F. Fekri, “**An Iterative Algorithm for Trust and Reputation Management**,” In Proceedings of *IEEE International Symposium on Information Theory - ISIT*, Seoul, Korea, Jun. 2009.
34. **E. Ayday** and F. Fekri, “**Using Node Accountability in Credential Based Routing for Mobile Ad-Hoc Networks**,” In Proceedings of *IEEE International Conference on Mobile Ad-hoc and Sensor Systems - MASS*, Atlanta, GA, Sep. 2008.

35. **E. Ayday**, F. Delgosha, and F. Fekri, “**AuCRB: An Efficient Mechanism to Provide Availability, Reliability and Authentication for Multihop Broadcasting in Wireless Networks**,” In Proceedings of *IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks - SECON*, San Francisco, CA, USA, Jun. 2008.
36. F. Delgosha, **E. Ayday**, and F. Fekri, “**MKPS: A Multivariate Polynomial Scheme for Symmetric Key-Establishment in Distributed Sensor Networks**,” In Proceedings of *International Wireless Communications and Mobile Computing Conference - IWCMC*, Hanolulu, Hawaii, USA, Aug. 2007.
37. **E. Ayday**, F. Delgosha, and F. Fekri “**Location-Aware Security Services for Wireless Sensor Networks using Network Coding**”, In Proceedings of *IEEE Conference on Computer Communications - INFOCOM*, Anchorage, AL, USA, May 2007.
38. F. Delgosha, **E. Ayday**, K. Chan, and F. Fekri “**Security Services in Wireless Sensor Networks Using Sparse Random Coding**”, In Proceedings of *IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks - SECON*, Reston, VA, USA, Sep. 2006.
39. **E. Ayday**, M. Altan, and C. Ayday “**Preparation and evaluation of engineering geological maps in 3-dimensional geographic information systems environment**”, In Proceedings of the *8th AGILE Conference on GIScience*, Estoril, Portugal, May 2005.
40. C. Ayday and **E. Ayday** “**The Use of GIS and GPS Integration for the Preparation of Quick Plans**”, In Proceeding of *GIS Ostrava Symposium*, Ostrava, Czech Republic, Jan. 2005.
41. M. Altan, H. Esenoglu, **E. Ayday** “**27 August 2004 Mars Observation and Results Obtained by Anadolu University, Satellite and Space Sciences Research Institute**” In Proceeding of *National Astronomy Congress*, Kayseri, Turkey, Sep. 2004.

Book Chapter

- **E. Ayday** and J.-P. Hubaux. “**Threats and Solutions for Genomic Data Privacy**” in *Medical Data Privacy Handbook*, Editors: Gkoulalas-Divanis, Aris, Loukides, Grigorios, Springer, 2015

Posters

1. J. Fellay, J. L. Raisaro, Z. Huang, M. Humbert, **E. Ayday**, P. J. McLaren, J.-P. Hubaux, and A. Telenti, “**Practical Solutions for Protecting Individual Genomic Privacy**”, *American Society of Human Genetics (ASHG)*, San Diego, CA, USA, October 2014.
2. **E. Ayday**, E. De Cristofaro, G. Tsudik, and J. P. Hubaux, “**Whole Genome Sequencing: Innovation Dream or Privacy Nightmare?** (poster),” In *22nd USENIX Security Symposium*, Washington, DC, USA, Aug. 2013.
3. **E. Ayday**, J. L. Raisaro, Mathias Humbert, and J. P. Hubaux, “**Towards Quantifying and Preventing the Leakage of Genomic Data Using Privacy-Enhancing Technologies** (poster),” In *22nd USENIX Security Symposium*, Washington, DC, USA, Aug. 2013.
4. **E. Ayday**, J. L. Raisaro, U. Hengartner, A. Molyneaux, and J. P. Hubaux, “**Towards Privacy Compliance in the Management of Raw Genomic Data** (poster),” In *USENIX Security Workshop on Health Information Technologies (HealthTech)*, Washington, DC, USA, Aug. 2013.
5. **E. Ayday**, F. Delgosha, and F. Fekri, “**Efficient Broadcast Authentication for Wireless Sensor Networks**,” In Proceedings of *IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks - SECON*, San Diego, CA, USA, Jun. 2007 (**Best Poster Award**).

Technical Reports

1. M. Humbert, **E. Ayday**, A. Telenti, and J. P. Hubaux, “**Reconciling Utility with Privacy in Genomics**,” EPFL-REPORT- 201547, Sep. 2014.
2. **E. Ayday**, J.L. Raisaro, U. Hengartner, A. Molyneaux, and J.P. Hubaux, “**Privacy-Preserving Processing of Raw Genomic Data**,” EPFL-REPORT- 187573, Jul. 2013.

3. **E. Ayday**, E. De Cristofaro, G. Tsudik, and J. P. Hubaux, “**The Chills and Thrills of Whole Genome Sequencing**,” arXiv:1306.1264 .
4. **E. Ayday**, J. L. Raisaro, and J. P. Hubaux, “**Privacy-Enhancing Technologies for Medical Tests Using Genomic Data**,” EPFL-REPORT-182897, Sep. 2012.
5. **E. Ayday** and S. Rajagopal, “**Secure Device Authentication Mechanisms for the Smart Grid-Enabled Home Area Networks**,” EPFL-REPORT-188373, Sep. 2013.

Papers Submitted or in Progress

1. J. L. Raisaro, **E. Ayday**, and J. P. Hubaux, “**Privacy-preserving genome-wide association studies**,” submitted for journal publication.
2. V. Kucuk, A. Halimi, and **E. Ayday**. “**Profile Matching Across Unstructured Online Social Networks: Threats and Countermeasures**”, submitted for conference publication.
3. N. Thenen, **E. Ayday**, and E. Cicek. “**Re-Identification of Individuals in Genomic Data-Sharing Beacons using High-Order Markov Chains**”, to be submitted for journal publication.
4. G. Kale, **E. Ayday**, and O. Tastan. “**Protecting the Privacy of Familial Ties in Public Genomic Databases**”, to be submitted for journal publication.
5. J. L. Raisaro, **E. Ayday**, and J. P. Hubaux, “**Privacy-preserving processing of insertions and deletions**,” to be submitted for journal publication.
6. **E. Ayday**, M. Humbert, J. Fellay, P. J. McLaren, J. Rougemont, J. L. Raisaro, A. Telenti, and J. P. Hubaux, “**Protecting Personal Genome Privacy: Solutions from Information Security**,” to be submitted for journal publication.
7. J. L. Raisaro, **E. Ayday**, and J. P. Hubaux, “**Privacy-preserving, Practical Genetic Tests on Android OS**,” to be submitted for conference publication.
8. **E. Ayday**, “**Belief Propagation for Trust and Reputation Management in Distributed Systems**,” to be submitted for journal publication.

Patents

1. J. L. Raisaro, E. Ayday, P. J. McLaren, J.-P. Hubaux and A. Telenti, “**Method for privacy-preserving medical risk tests**”, Europe and USA, No. 14531034 and EP15192662.3, November 2015.
2. **E. Ayday**, J. L. Raisaro, U. Hengartner, A. Molyneaux, and J. P. Hubaux, “**Privacy-Preserving Processing of Raw Genomic Data**,” Provisional patent application has been filed, May 2013.
3. **E. Ayday**, J. Zou, A. Einolghozati, and F. Fekri, “**Methods and Algorithms for Recommender Systems via Belief Propagation on Graphical Models**,” Provisional patent application has been filed, Feb.2013.
4. **E. Ayday**, M. Humbert, J. Fellay, P. J. McLaren, J. Rougemont, J. L. Raisaro, A. Telenti, and J. P. Hubaux, “**Genomic Privacy Protection**,” Provisional patent application has been filed, Sep. 2012.
5. **E. Ayday** and F. Fekri “**Systems and Methods for Providing Reputation Management**,” Provisional patent application has been filed, Jul. 2011.

Invited Talks

1. “Protecting Sensitive Data”, March 2016, invited talk at the European Parliament, Brussels, Belgium.
2. “Cryptographic Solutions for Genomic Privacy”, February 2016, keynote speech at Workshop on Encrypted Computing and Applied Homomorphic Cryptography – WAHC’16, Barbados.
3. “Security and Privacy in the Age of Big Data”, May 2016, International Cyber Security Workshop and Certificate Program, Istanbul, Turkey.
4. “Privacy in the Genomic Era”, October 2015, Dagstuhl Seminar on Genomic Privacy, Wadern, Germany.

5. “Security and Privacy in the Age of Big Data: The Case of Genomics”, October 2015, EMO Academic Camp, Izmir, Turkey.
6. “Privacy and Security in the Genomic Era”, May 2015, IDEA Teknoloji Cozumleri, Istanbul, Turkey.
7. “Security and Privacy in the Age of Big Data: The Case of Genomics”, University of Luxembourg, Mar. 2015.
8. “Security and Privacy in the Age of Big Data: The Case of Genomics”, Tubitak Bilgem, Nov. 2014.
9. “Security and Privacy in the Age of Big Data: The Case of Genomics”, Bilkent University, Nov. 2014.
10. “Genomic Privacy: Threats, Challenges, and Solutions”, Koc University, Turkey, Mar. 2014.
11. “Security and Privacy in the Age of Digital Medicine”, University of Delaware, Newark, DE, USA Mar. 2014.
12. “Genomic Privacy: Threats, Challenges, and Solutions”, Syracuse University, Syracuse, NY, USA, Feb. 2014.
13. “Genomic Privacy: Threats, Challenges, and Solutions”, Indiana University-Purdue University Indianapolis, Indianapolis, IN, USA, Feb. 2014.
14. “Security, Privacy, and Data Analytics in the Age of Big Data”, Ozyegin University, Turkey, Feb. 2014.
15. “Security, Privacy, and Data Analytics in the Age of Big Data”, VU University, Amsterdam, Netherlands, Jan. 2014.
16. “Towards Genomic Privacy”, Center for Signal and Image Processing (CSIP) Seminar, Georgia Institute of Technology, Atlanta, GA, USA, Dec. 2013.
17. “Genomic Privacy: Threats, Challenges, and Solutions”, University of Cincinnati, Cincinnati, OH, USA, Dec. 2013.
18. “Protecting and Quantifying Genomic Privacy”, Dagstuhl Seminar on Genomic Privacy, Wadern, Germany, Oct. 2013.
19. “Iterative Algorithms for Reputation Management and Recommender Systems”, University of Alabama at Birmingham, Department of Computer and Information Sciences, Feb. 2011.
20. “Iterative Algorithms for Reputation Management and Recommender Systems”, Bahcesehir University, Computer Engineering Department, Apr. 2010.

Tutorials

- “Privacy and Security in the Genomic Era”, *ACM Conference on Computer and Communications Security (CCS)*, Vienna, Austria, Oct. 2016.

Thesis

- “Iterative Algorithms for Trust and Reputation Management and Recommender Systems”, Georgia Institute of Technology, Dec. 2011.

PROFESSIONAL ACTIVITIES

- Program Committee Chair:
 - International Workshop on Genome Privacy and Security (GenoPri), 2016, 2017.
- Technical Program Committee:
 - Annual Conference on Privacy, Security and Trust (PST) 2017
 - IEEE Conference on Dependable and Secure Computing (DSN) 2017
 - ACM Asia Conference on Computer and Communications Security (AsiaCCS), 2016, 2017.
 - ACM Conference on Computer and Communications Security (CCS) 2016.
 - The Network and Distributed System Security Symposium (NDSS) 2017.
 - Privacy Enhancing Technologies Symposium (PETS), 2014, 2015, 2016.
 - The 42nd Annual Conference of the IEEE Industrial Electronics Society (IECON) 2016.
 - The 1st IEEE ICDM International Workshop on Privacy and Discrimination in Data Mining (PDDM) 2016.
 - IEEE Consumer Communications and Networking Conference (CCNC), Security, Privacy and Content Protection Track, 2016.
 - The International Conference on Information Security and Cryptology (Inscrypt), 2015, 2016.

- Privacy-aware computational genomics 2015 (PRIVAGEN), 2015.
- International Workshop on Genome Privacy and Security (GenoPri), 2015, 2016
- International Conference on Multimedia and Biometrics Security (ICMBS), 2014.
- International Conference on Computer and Computational Intelligence (ICCCI) 2014.
- IEEE Signal Processing and Communications Applications Conference (SIU), 2012, 2013, 2014.
- IEEE Symposium on Industrial Electronics & Applications (ISIEA), 2012, 2013.
- Workshop on Context-Awareness and Personalization Systems (CAPS), 2013.
- International Conference on Artificial Intelligence (ICAI), 2013.
- International Journal on Artificial Intelligence.

- Student Travel Grant Chair:
 - PETS Workshop on Genome Privacy (GenoPri), 2014.

- Editorial Board:
 - Proceedings on Privacy Enhancing Technologies (PoPETs)

- Journal Referee:
 - IEEE Transactions on Information Theory, IEEE Transactions on Communications, IEEE Communications Letters, Elsevier Ad Hoc Networks, Elsevier Computer Networks, IEEE Transactions Dependable and Secure Computing, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Wireless Communications, Plos ONE, The Computer Journal, Concurrency and Computation: Practice and Experience.

- Conference Referee:
 - ACM CCS, Usenix Security, PETS, NDSS, IEEE INFOCOM, IEEE CNS, IEEE SECON, ACM MobiCom, IEEE GLOBECOM, ISIT, IEEE ICC, IEEE PIMRC, IEEE ICCSC.

PROFESSIONAL MEMBERSHIPS

- IEEE / IEEE Communications Society (IEEE COMSOC)
- ACM

TEACHING

- CS 577 - Data Privacy, Bilkent University, Spring 2015, Spring 2016, Spring 2017
- CS202 – Fundamental Structures of Computer Science II, Bilkent University, Fall 2015, Fall 2016
- CS 101 - Algorithms & Programming I, Bilkent University, Fall 2015, Spring 2017
- CS 102 - Algorithms & Programming II, Bilkent University, Spring 2015, Spring 2016
- CS590/690 – Research Seminar I/II, Bilkent University, Fall 2015
- CS 491/492 - Senior Design Project, Bilkent University
- Mobile Networks, EPFL, Spring 2013, 2014 - Guest Lecturer and Assistant
- Coding Theory and Applications, Georgia Tech, Spring 2011 - Assistant
- Introduction to DSP, Georgia Tech, Spring 2010 - Lab Assistant

GRADUATE STUDENTS (AT BILKENT UNIVERSITY)

1. Volkan Kucuk, M.S., “De-anonymizing unstructured online social networks”, February 2015 – January 2017, expected graduation 2017.
2. Saharnaz Esmailzadeh Dilmaghani, M.S., “Automatic encryption of documents containing personal information”, September 2015 – June 2017, expected graduation 2017.

3. Arif Yilmaz, M.S., “Content ownership and liability issues of genomic data”, September 2015 – June 2017, expected graduation 2017.
4. Didem Demirag, M.S., “Privacy-preserving data sharing and utilization between entities”, September 2015 – June 2017, expected graduation 2017.
5. Huseyin Celal Oner, M.S., “Detecting compromised and fake accounts on online social networks”, September 2015 – June 2017, expected graduation 2017.
6. Dorukhan Arslan, M.S., “Protection of location information beyond brute-force bound”, September 2015 – June 2017, expected graduation 2017.
7. Mohammad Mobayen, M.S., “Tradeoff between utility and privacy of genomic data”, September 2015 – June 2017, expected graduation 2017.
8. Anisa Halimi, Ph.D., “Graphical algorithms for de-anonymizing and anonymizing online social networks”, September 2015 – June 2019, expected graduation 2019.
9. Nour M. AlMadhoun, Ph.D. (co-supervised), “On the tradeoff between privacy and utility in genomic studies: Differential privacy under random sampling”, September 2015 – June 2019, expected graduation 2019.
10. Ahmet Erkan, Ph.D. (co-supervised), “Efficient, graphical intrusion detection algorithms for heterogeneous networks”, September 2015 – June 2019, expected graduation 2019.
11. Emre Yilmaz, Ph.D. (co-supervised), “Privacy-preserving aggregate queries for optimal location selection”, September 2015 – June 2019, expected graduation 2019.
12. Noushin Salek, M.S. (co-supervised), “A privacy-preserving solution for the bipartite ranking problem”, September 2015 – June 2017, expected graduation 2017.
13. Gulce Kale, M.S. (co-supervised), “Protecting the privacy of familial ties in public genomic databases”, September 2015 – June 2017, expected graduation 2017.
14. Nora Von Thenen, M.S. (co-supervised), “Re-identification of individuals in genomic data-sharing beacons using high-order Markov Chains”, September 2015 – June 2017, expected graduation 2017.

UNDERGRADUATE STUDENTS (AT BILKENT UNIVERSITY)

1. Erin Avllazagaj, B.S., “Inference attacks on public datasets”
2. I. Omer Celik, B.S., “A study on the potential threats from smartphone permissions and countermeasures”
3. Beyza Dabak, B.S., “Inference attacks for genomic databases”
4. Bahadir Durmaz, B.S., “Linkability of individuals on online social networks”

SUPERVISED STUDENT PROJECTS (AT EPFL)

1. Frank Youssef, Genomic Privacy: new cryptographic solutions for efficient susceptibility tests with access control, Spring 2014
2. Kevin Serrano, Privacy-Preserving genome-wide association studies on encrypted genomes, Spring 2014.
3. Paul Bottinelli, Exploration of a non-crypto solution for protecting genomic data, Spring 2014.
4. Genini Leonardo, Enhancement of order-preserving encryption on raw genomic data, Spring 2014.
5. Kevin Serrano and Jeremy Weber, Implementation of privacy-preserving genomic applications on Android, Fall 2013.
6. Quan Jiang, Efficient, Privacy-preserving similarity computation for genomic data, Fall 2013.
7. Muhammad Naveed, Using functional encryption for genomic privacy, Fall 2013.
8. Identifying familial ties from genomic data, Fall 2013.
9. Aymeric Laurent and Quentin Praz, Inferring familial relationships from genomic data, Fall 2013.
10. Damien Augsburger, De-anonymizing genomic-website participants and inferring other personal information from publicly available data, Fall 2013.
11. Yorick Chollet, Optimization of scientific utility while preserving genomic privacy by using a decision-theoretic model, Fall 2013.
12. Kevin Serrano, Privacy-preserving database management and access control for genomic data, Spring 2013.
13. Jean Louis Raisaro, Implementation of privacy-preserving disease risk test, Spring 2013.

14. Zhicong Huang, Implementation of privacy-preserving management of raw genomic data, Spring 2013.
15. Jean Louis Raisaro, Implementation of privacy-preserving algorithms for genetic tests, Fall 2012.

REFERENCES

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