

Hidayet AKSU

PERSONAL DATA

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 LINKEDIN: <https://www.linkedin.com/in/hidayet>

EDUCATION

- 02/2008 - 07/2014 | **Doctor of Philosophy** in COMPUTER ENGINEERING, Bilkent University, Ankara, Turkey
 Thesis: "Efficient Analysis of Large-Scale Social Networks using Big-Data Platforms"
 Advisor(s): Ibrahim KORPEOGLU and Özgür ULUSOY
- 09/2005 - 02/2008 | **Master of Science** in COMPUTER ENGINEERING, Bilkent University, Ankara, Turkey
 Thesis: "An inquiry into the metrics for evaluation of localization algorithms in wireless ad hoc and sensor networks"
 Advisor: Ibrahim KORPEOGLU
- 09/2000 - 05/2005 | **Bachelor of Science** in COMPUTER ENGINEERING, Bilkent University, Ankara, Turkey
 Thesis: "Role Based Access Control Protocol"
 Advisor: Ali Aydın SELCUK

RESEARCH AND TEACHING EXPERIENCE

- 09/2015 - PRESENT | at FLORIDA INTERNATIONAL UNIVERSITY, Miami, Florida, USA
Postdoctoral Associate at College of Engineering and Computing
 - Research: "Cyber Security, Internet of Things (IoT), Data Analytics, Smart Grid, Social Networks"
 - Teaching: EEL 6787 Network Security
 - Writing: Grant proposals and research articles
 - Mentoring: Grad and undergrad students
- 2014/2015 - SPRING | at BILKENT UNIVERSITY, Ankara, Turkey
Adjunct faculty at Computer Engineering Department
 - Teaching: CS-102 Algorithms and Programming II - Spring '15.
- 10/2013 - 07/2014 | at BILKENT UNIVERSITY, Ankara, Turkey
Graduate Researcher at Computer Engineering Department
 - Research: "Big Data Analytics, Social Networks, Cyber Security"

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|-------------------|---|
| 9/2012 - 9/2013 | <p>at IBM T.J. WATSON RESEARCH CENTER, New York, USA
<i>Visiting Scholar at Intelligent Information Management Department</i></p> <ul style="list-style-type: none"> • Research: “Big Data Analytics, Social Networks, Cyber Security” • Responsible for research in Big Data Graph system. • Invented and implemented some social networks algorithms in Big Data context. • Exploited HBase Coprocessor feature for large scale social media analytics. • Provide support for Hadoop/HBase apps. |
| 02/2008 - 09/2012 | <p>at BILKENT UNIVERSITY, Ankara, Turkey
<i>Graduate Researcher at Computer Engineering Department</i></p> <ul style="list-style-type: none"> • Research: “Wireless Sensor Networks, Localization, Big Data Analytics, Social Networks, Cyber Security” |

PUBLICATIONS

- | | |
|------|---|
| 2011 | <p>“A study of localization metrics: Evaluation of position errors in wireless sensor networks”, Hidayet Aksu, Demet Aksoy, and Ibrahim Korpeoglu. 2011. <i>Comput. Netw.</i> 55, 15 (October 2011), 3562-3577. DOI=10.1016/j.comnet.2011.06.023 http://dx.doi.org/10.1016/j.comnet.2011.06.023.</p> |
| 2013 | <p>“Multi-resolution Social Network Community Identification and Maintenance on Big Data Platform”, Hidayet Aksu, Mustafa Canim, Yuan-Chi Chang, Ibrahim Korpeoglu, Ozgur Ulusoy. 2013. <i>Big Data (BigData Congress), 2013 IEEE International Congress on.</i> vol., no., pp.102,109, June 27 2013-July 2 2013. DOI=10.1109/BigData.Congress.2013.23 Best Paper Award http://dx.doi.org/10.1109/BigData.Congress.2013.23.</p> |
| 2014 | <p>“Distributed k-Core View Materialization and Maintenance for Large Dynamic Graphs”, Hidayet Aksu, Mustafa Canim, Yuan-Chi Chang, Ibrahim Korpeoglu, Ozgur Ulusoy. 2013. <i>Knowledge and Data Engineering, IEEE Transactions on.</i> DOI=10.1109/TKDE.2013.2297918 http://dx.doi.org/10.1109/TKDE.2013.2297918.</p> |
| 2015 | <p>“Efficient community identification and maintenance at multiple resolutions on distributed datastores”, Hidayet Aksu, Mustafa Canim, Yuan-Chi Chang, Ibrahim Korpeoglu, Ozgur Ulusoy. 2015. <i>Data & Knowledge Engineering.</i> DOI=10.1016/j.datak.2015.06.001 http://dx.doi.org/10.1016/j.datak.2015.06.001.</p> |
| 2015 | <p>“Graph Aware Caching Policy For Distributed Graph Stores”, Hidayet Aksu, Mustafa Canim, Yuan-Chi Chang, Ibrahim Korpeoglu, Ozgur Ulusoy. 2015. <i>Cloud Engineering (IC2E), 2015 IEEE International Conference on.</i> DOI=10.1109/IC2E.2015.39 http://dx.doi.org/10.1109/IC2E.2015.39.</p> |
| 2016 | <p>“An Analysis of Social Networks based on Tera-scale Telecommunication Datasets”, Hidayet Aksu, Ibrahim Korpeoglu, Ozgur Ulusoy. 2016. <i>Emerging Topics in Computing, IEEE Transactions on.</i> DOI=10.1109/TETC.2016.2627034 http://dx.doi.org/10.1109/TETC.2016.2627034.</p> |

- 2017 | **“Identifying Counterfeit Smart Grid Devices: A Lightweight System Level Framework”**, Leonardo Babun, Hidayet Aksu, A.Selcuk Uluagac. 2017. *IEEE International Conference on Communications (ICC) 2017*.
- 2016 | **“WACA: Wearable-Assisted Continuous Authentication Framework with Motion Sensors”**, Abbas Acar, Hidayet Aksu, Kemal Akkaya, and A. Selcuk Uluagac. Poster Session presented at: *USENIX Security '16*. 2016 August 10-12 Austin, TX.
- 2016 | **“A Framework for Counterfeit Smart Grid Device Detection”**, Leonardo Babun, Hidayet Aksu, and A. Selcuk Uluagac. Poster Session presented at: *Communications and Network Security (CNS), 2016 IEEE International Conference on*. 2016 October 17-19 Philadelphia, PA.
- 2017 | **“A Framework for Compromised Smart Grid Device Detection”**, Leonardo Babun, Hidayet Aksu, and A. Selcuk Uluagac. Poster Session presented at: *Cybersecurity Center for Secure Evolvable Energy Delivery Systems (SEEDS) Annual Meeting* January 2017 Miami, FL. **Best Student Poster Award**.
- 2017 | **“A System-Level Framework to Detect Compromised Smart Grid Devices”**, Leonardo Babun, Hidayet Aksu, and A. Selcuk Uluagac. Poster Session presented at: *Research Annual Conference on Cybersecurity* March 2017 Gainesville, FL. **Best Demo Award**.
- 2017 | **“Curie: Policy-based Secure Data Exchange Framework”**, Z. Berkay Celik, Abbas Acar, Hidayet Aksu, A. Selcuk Uluagac, Patrick McDaniel. 2017. *arXiv preprint arXiv:1702.08342* <https://arxiv.org/abs/1702.08342>.
- 2017 | **“A Survey on Homomorphic Encryption Schemes: Theory, Implementation, and Applications”**, Abbas Acar, Hidayet Aksu, A. Selcuk Uluagac, and Mauro Conti. 2017. *arXiv preprint arXiv:1704.03578* <https://arxiv.org/abs/1704.03578>.
- 2017 | **“6thSense: A context-aware sensor-based attack detector for smart devices”**, Amit Kumar Sikder, Hidayet Aksu, and A. Selcuk Uluagac. *26th USENIX Security Symposium (USENIX Security 17)*. Vancouver, BC: USENIX Association, 2017 <https://www.usenix.org/conference/usenixsecurity17/technical-sessions/presentation/sikder>

WORKS SUBMITTED & IN PROGRESS

- 2017 | **“Achieving Secure and Differentially Private Computations in Multiparty Settings”**, Abbas Acar, Z. Berkay Celik, Hidayet Aksu, A. Selcuk Uluagac, Patrick McDaniel. *in submission*.
- 2017 | **“ID4IoT: Identification of BLE speaking IoT Devices”**, Hidayet Aksu, A. Selcuk Uluagac, and Elizabeth S. Bentley. *in submission*.
- 2017 | **“Identification of Wearable Devices with Bluetooth”**, Hidayet Aksu, A. Selcuk Uluagac, and Elizabeth S. Bentley. *in submission*.
- 2017 | **“Doomsday for Smart Grid Device Counterfeiters: A System Level Detection Framework”**, Leonardo Babun, Hidayet Aksu, and A. Selcuk Uluagac. *in submission*.

- 2017 | **“CPS Device Class Identification via Host-Based Fingerprinting”**, Leonardo Babun, Hidayet Aksu, and A. Selcuk Uluagac. *in submission*.
- 2017 | **“A Survey on System and Function Call Hooking Techniques”**, Juan Lopez, Leonardo Babun, Hidayet Aksu, and A. Selcuk Uluagac. *in submission*.
- 2017 | **“A Survey of Side Channel Threats to Cyber-Physical Systems and Internet-of-Things”**, Amit Kumar Sikder, Hidayet Aksu, and A. Selcuk Uluagac. *in submission*.
- 2017 | **“WACA: Wearable-Assisted Continuous Authentication”**, Abbas Acar, Hidayet Aksu, Kemal Akkaya, and A. Selcuk Uluagac. *in submission*.
- 2017 | **“Design of A Bonus-Based IoT-CPS Security Class”**, Bharath Nuthakki, Hidayet Aksu, and A. Selcuk Uluagac. *in submission*.
- 2016 | **“A Novel Covert Storage Channel on Wearables Using Status Bar Notifications”**, Kyle Denney, A. Selcuk Uluagac, Hidayet Aksu, Kemal Akkaya. *in submission*.
- 2016 | **“Achieving Security and Availability in Post-Disaster Smart Grid Networks”**, Abdullah Aydeger, Nico Saputro, Hidayet Aksu, A. Selcuk Uluagac, Kemal Akkaya. *in submission*.
- 2016 | **“Efficient Implementation and Performance-Evaluation of FHE on Android Systems”**, Fatih Deniz, Hidayet Aksu, A. Selcuk Uluagac. *work in progress*.

SPONSORED RESEARCH PROJECTS (Granted)

PRIVACY-PRESERVING WEARABLE-ASSISTED CONTINUOUS AUTHENTICATION FRAMEWORK

- Program: NSF’s Secure and Trustworthy Cyberspace (SaTC) Program with Transfer To Practice (TTP) option
- Role: Senior personnel
- Budget: \$500K
- Period of Performance: 08/16/17 - 08/15/19

SPONSORED RESEARCH PROJECTS (Pending)

A COMPREHENSIVE DEVICE FINGERPRINTING FRAMEWORK

- Program: Army Research Office (ARO)
- Role: co-PI
- Budget: \$385K
- Period of Performance: 12/15/17 - 08/14/19

IFF: IDENTIFICATION OF CPS DEVICES VIA HOST FINGERPRINTING

- Program: Office of Naval Research (ONR) Young Investigator Program (YIP)
- Role: Senior personnel
- Budget: \$510K
- Period of Performance: 06/01/17 - 05/30/20

IOTFARM: A FRAMEWORK TO ANALYZE AND MITIGATE INTERNET-SCALE IOT ATTACKS

- Program: NSF’s Cyber-Physical Systems (CPS) program
- Role: Research Associate
- Budget: \$500K
- Period of Performance: 12/15/17 - 12/15/20

PATENTS

- 2016 | **“Distributed k-core view materialization and maintenance for graphs”**, Hidayet Aksu, Mustafa Canim, Yuan-Chi Chang. 2016. *US Patent 9,275,422, 2016 B2 Publication date Mar 1, 2016* <https://patents.google.com/patent/US9275422>.
- 2016 | **“A Method for Identification and Detection of Counterfeit Resource–Limited Devices using Correlation and System Call Tracing Techniques.”**, Leonardo Babun, Hidayet Aksu, and A. Selcuk Uluagac. 2016. *invention submitted* .
- 2016 | **“A Method for Identification of Internet-of-things Devices with Machine Learning and IoT Protocols.”**, Hidayet Aksu, A. Selcuk Uluagac, and Elizabeth S. Bentley. 2016. *invention in progress with Airforce Researce Lab (AFRL)*.

MEDIA INTERVIEW

- 2016 | **“Guard Your Gadgets”**, Leisa Williams, WSVN Channel 7, November 11, 2016, Miami, Florida, <http://wsvn.com/news/special-reports/guard-your-gadgets>.

RESEARCH SUPERVISION/MENTORING/TRAINING

- | | |
|-------|---|
| PH.D. | <ul style="list-style-type: none"> • Abbas Acar (in progress) • Amit Sikder (in progress) • Leonardo Babun (in progress) |
| M.S. | <ul style="list-style-type: none"> • Enes Erdin (in progress) • Arian Suarez (in progress) • Burak Yesilyurt (in progress) • Michael Alexander Alan (Spring 2016) • Abdul Qahir Nawabi (Spring 2016) • Allan Shaji Manamel (Spring 2016) • Bharath Nuthakki (Spring-Fall 2016) |
| B.S. | <ul style="list-style-type: none"> • Aaron Paz (in progress) • Juan Lopez (in progress) • Kyle Denney (Summer 2016) • Vickie Christie Victor (Summer 2016) • Eric Stutzman (Summer 2016) • Danielle Kritz (Summer 2016) • Ben Graham (Summer 2016) |

PROFESSIONAL ACTIVITIES

TECHNICAL PROGRAM COMMITTEE MEMBER

- The 14th IEEE International Conference on Advanced and Trusted Computing (ATC), 2017
- IEEE Local Computer Networks (LCN), 2017
- IEEE ICC 2017 Communication and Information Systems Security Symposium, 2017
- IEEE International Workshop on Automation Protocols Security in Cyber-Physical Systems (APS-CPS), 2016
- IEEE Local Computer Networks (LCN), 2016
- IEEE International Workshop on Low-Layer Implementation and Protocol Design for IoT Applications (IoT-LINK), 2016
- IEEE Conference on Network Functions Virtualization & Software Defined Networks (NFV-SDN), 2016
- International Workshop on Cyber-Physical Systems Security (CPS-Sec), 2016

REVIEWER

- IEEE Transactions on Parallel & Distributed Systems
- IEEE Transactions on Information Forensics & Security
- IEEE Transactions on Systems, Man and Cybernetics: Systems
- IEEE Transactions on Cybernetics
- IEEE Transactions on Cloud Computing
- IEEE Transactions on Computational Social Systems
- IEEE Systems Journal
- Ad Hoc Networks, Elsevier
- IET Wireless Sensor Systems
- IEEE ICC 2016 Communication and Information Systems Security Symposium
- 38th Annual IEEE Conference on Local Computer Networks
- 20th IEEE Symposium on Computers and Communications (ISCC) 2015
- 2014 International Conference on Selected Topics in Mobile and Wireless Networking (MoWNet'2014)

AWARDS AND HONORS

- **Best Paper Award**, IEEE International Congress on Big Data (Big-Data Congress), 2013
- **Best Student Poster Award**, Cybersecurity Center for Secure Evolvable Energy Delivery Systems (SEEDS) Annual Meeting, 2017
- **Best Demo Award**, Research Annual Conference on Cybersecurity, 2017
- **Sigma Xi**, Full Member, 2016
- Ranked 202th in Science-Mathematics category among 1.5 million students in Nationwide University Entrance Exam in Turkey, 2000
- **Full scholarship, Bilkent University**, Turkey, 2000.
- **Full scholarship, Bilkent University**, Turkey, 2005 (for M.S. Degree).
- **Full scholarship, Bilkent University**, Turkey, 2008 (for Ph.D. Degree).
- **Certified Information Systems Auditor (CISA) by ISACA**, License No: 1188257, 2011

CERTIFICATES AND SPECIAL TRAINING

- 2005 **Fundamentals of banking** training
- 2006 **IT Security** training
- 2007 **Ethical Hacker** training
- 2009 **MySql Database tuning** training
- 2009 **Oracle DBA** training
- 2010 **Voip** training
- 2011 **Certified Information Systems Auditor (CISA) by ISACA**, License
No: 1188257

INDUSTRY EXPERIENCE

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|-------------------|--|
| 9/2013 - 9/2015 | <p>at INFORMATION TECHNOLOGY AND COMMUNICATION AUTHORITY, Ankara, Turkey
<i>Communication Expert at Turkey Computer Emergency Response Team (TR-CERT)</i></p> <ul style="list-style-type: none"> • Launched nation-wide malware communication tracking (sink-hole) project. • Warn critical sectors about significant cyber security issues. • Participated in nation-wide honeypot project to collect malware samples. |
| 11/2007 - 9/2012 | <p>at INFORMATION TECHNOLOGY AND COMMUNICATION AUTHORITY, Ankara, Turkey
<i>Senior Software Engineer at Information Systems Department</i></p> <ul style="list-style-type: none"> • Responsible for development and maintenance of mission critical, highly available, data intensive applications. • Responsible for a team and reported to department manager. Worked in mission critical projects which process approximately 1 TB data per day. • Participated in design, implementation, deployment, and maintenance of a distributed database system based on MySQL which manages more than 150TB data. • Designed, implemented, deployed and maintained enterprise level solutions for 10+ in-house projects. • Participated in trainings on MySQL DBA, Performance tuning & High Availability, Oracle 10g: Data Warehousing Fundamentals, Oracle 10g: implement and administrate a Data Warehouse, Cisco Voice over IP. |
| 12/2005 - 11/2007 | <p>at BANKING REGULATION AND SUPERVISION AGENCY, Ankara, Turkey
<i>Assistant IT Auditor at Information Management Department</i></p> <ul style="list-style-type: none"> • Participated in preparation of regulations for financial institutions IT compliance to Basel II framework. • Obtained CISA (Certified Information System Auditor) Certificate • Gained the proficiency on overall Information System Infrastructure in Financial Institutions, and IT audit and management skills. Observed the role and use of Information system to achieve business goals. |
| 7/2005 - 12/2005 | <p>at TUBITAK-UEKAE RESEARCH CENTER, Ankara, Turkey
<i>Full time Software Engineer and Researcher in mission critical "MARS" project.</i></p> |

- Designed and implemented a Kerberos style authentication and encryption framework for the system (Secure channel for .NET Remoting).
- Gained proficiency at using Oracle, XML technologies, C# .Net and MKS Software Configuration Management Tool.

COMPUTER SKILLS

- Full proficiency
- **Programming:** JAVA(10+ experience), C/C++, C#, PL-SQL, BASH, UML, XML, ~~LaTeX~~, SWIFT
 - **Programming Tools:** ECLIPSE, IntelliJ IDEA, NetBeans, Visual Studio.NET, XCode
 - **Operating Systems:** LINUX REDHAT/UBUNTU(10+ experience), UNIX(Solaris), WINDOWS 2000/7/8/XP, ANDROID, IOS
 - **Relational Databases:** MYSQL(10+ experience), ORACLE, SQLITE, H2
 - **NoSql Technologies:** HBASE, HADOOP, APACHE ZOOKEEPER

EXTRACURRICULAR ACTIVITIES

- 2016 | “Volunteer,” Engineering Expo, FIU College of Engineering and Computing, February 26, 2016, Miami, Florida.
- 2016 | “Volunteer,” Miami Pre-College Enrichment and Preparation (PREP) STEM Summer Program, FIU College of Engineering and Computing, July 31, 2016, Miami, Florida.
- 2017 | “Volunteer,” Engineering Expo, FIU College of Engineering and Computing, February 24, 2017, Miami, Florida.

INTERESTS AND ACTIVITIES

- Big Data, Intelligent Data Management, Computer Networks, Social Networks, Cyber Security, IoT, Technology, Open-Source Programming
- Table Tennis, Travelling, Hiking, Philosophy, Astronomy

PERSONAL TRAITS

- Team worker, good communication skills, accountable, keen on learning, predisposed to using new technologies in daily life, enjoy research & development
- Finding solutions to daily life problems by using technological innovations