

XIALI HEI

OFFICE: 301 E. Lewis Street, Lafayette, LA 70503, USA, Office: 1-337-482-1037

EMAIL: starindark001@gmail.com

HOME PAGE: www.xialihei.com

RESEARCH INTEREST

Cyber-physical System Security, Novel Attacks, Medical Device Security, Captcha Attacks and Design

EDUCATION

Temple University

Ph.D. of Computer Science

Sep. 2009 - May 2014

Advisor: Dr. Xiaojiang Du and Dr. Shan Lin

TSingHua University

M.S. of Software Engineering

Sep. 2002 - Jul. 2005

Advisor: Dr. Lin

Xi'an Jiaotong University

B.S. of Electronic Engineering

Sep. 1998 - Jul. 2002

Advisor: Dr. Jianyi Liu

HONORS AND AWARDS

08/2014 ACM 2014 MobiHoc Best Poster Runner-up Award

12/2013 Dissertation Completion Fellowship

04/2013 The Bronze Award Best Graduate Project in Future of Computing Competition

04/2013 IEEE INFOCOM student travel grant

12/2010 IEEE GLOBECOM student travel grant

GRANTS

Project Title: CRII: SaTC: CPS: RUI: Cyber-Physical System Security in Implantable Insulin Injection Systems. Amount: \$174,995. 06/1/2016-12/31/2019, NSF CNS-1566166, CNS-1812553.

Project Title: A Human-Aware Energy-efficient Security Framework for Memory-restrained Internet of Everything Devices. State of Delaware Federal Research and Development Matching Grant Program. Amount: \$99,997. 11/1/2015-10/31/2017.

Professional Development Fund, \$3,500. 04/1/2016-05/30/2016.

NEWS

Report about our Captcha paper by **The Register**. https://www.theregister.co.uk/2019/09/04/recaptcha_robot_hack/

Report about our USENIX Security paper **The Register**. https://www.theregister.co.uk/2018/08/28/hacking_motion_control/

WORKING EXPERIENCE

University of Louisiana at Lafayette

Tenure-track

Aug. 2017 - present

Assistant Professor

Delaware State University
Tenure-track

Aug. 2015 - Jul. 2017
Assistant Professor

Frostburg State University
Tenure-track

Aug. 2014 - Jul. 2015
Assistant Professor

PUBLICATIONS

CONFERENCE

29. [CCS2019] Yazhou Tu, Sara Rampazzi, Bin Hao, Angel Rodriguez, Kevin Fu, and **Xiali Hei**. “Trick or Heat? Manipulating Critical Temperature-Based Control Systems Using Rectification Attacks.” *ACM CCS*, 2019. [paper]
28. [DSN2019] Pingchuan Ma, Zhiqiang Wang, **Xiali Hei**, Xiaoxiang Zou, Jianyi Zhang, Qixu Liu, Xin Lyu, and Zihan Zhuo. “A Quantitative Approach for Medical Imaging Device Security Assessment.” *The 49th Annual IEEE/IFIP International Conference on Dependable Systems and Networks Supplemental Volume (DSN-S)*, 2019. [paper]
27. [USENIX2018] Yazhou Tu, Zhiqiang Lin, Insup Lee, and, **Xiali Hei**. “Injected and Delivered: Fabricating Implicit Control over Actuation Systems by Spoofing Inertial Sensors.” *USENIX SECURITY Symp. 2018*, 2018. [paper]
26. [MASS2018] Bin Hao, **Xiali Hei**, Yazhou Tu, Xiaojiang Du, and Jie Wu. “Voiceprint-Based Access Control for Wireless Insulin Pump Systems.” *IEEE MASS 2018*, 2018. [paper]
25. [ICC2018-1] Jian Zhao, Kam Kong, **Xiali Hei**, Yazhou Tu and Xiaojiang Du. “A Visible Light Channel based Access Control Scheme for Wireless Insulin Pump Systems.” *IEEE ICC 2018*, 2018. [paper]
24. [ICC2018-2] Kuo Chi, Longfei Wu, Xiaojiang Du, Guisheng Yin, Jie Wu, Bo Ji, and **Xiali Hei**. “Enabling Fair Spectrum Sharing between Wi-Fi and LTE-Unlicensed.” *IEEE ICC 2018*, 2018. [paper]
23. [ICC2017-SHIPHER] **Xiali Hei**, Binheng Song, and Caijin Ling. “SHipher: Families of Block Ciphers based on customized operator.” *IEEE ICC 2017*, 2017. [paper]
22. [ICC2017-2] Kam Kong, **Xiali Hei**, Caijin Ling, Mohsen Guizani, and Hui Cao. “A Countermeasure Against Face-Spoofing Attacks Using Interaction Video Framework.” *IEEE ICC 2017*, 2017. [paper]
21. [GLOBECOM2016] Caijin Ling, **Xiali Hei**, Kam Kong, Michael Peays, and Mohsen Guizani. “You Cannot Sense My PINs: A Side Channel Attack Deterrent Solution for Touch-enabled Devices.” *IEEE GLOBECOM 2016*, 2016. [paper]
20. [CISS2015] Gang Wang, Wenming Li, and **Xiali Hei**. “Energy-aware real-time scheduling on Heterogeneous Multi-Processor.” *In Proc. of the 49th Information Sciences and Systems (CISS)*, 2015. [paper]
19. [EISOP2015] Xunyu Pan, Timothy J Cross, Liangliang Xiao, and **Xiali Hei**. “Musical examination to bridge audio data and sheet music.” *T/SPIE Electronic Imaging. International Society for Optics and Photonics*, 2015. [paper]
18. [EHEALTH2014] **Xiali Hei** and Shan Lin. “Multi-part file encryption for electronic health records cloud.” *In the Proceedings of the 4th ACM MobiHoc Workshop on Pervasive wireless healthcare*, 2014. [paper]
17. [MOBIHOC2014] **Xiali Hei**, Xiaojiang Du, and Shan Lin. “Near field communication based access control for wireless medical devices.” *In the Proceedings of the 15th ACM international symposium on Mobile ad hoc networking and computing*, 2014. **Best Poster Runner-up Award!** [paper]
16. [PIPAC] **Xiali Hei**, Xiaojiang Du, Shan Lin, and Insup Lee. “PIPAC: Patient Infusion Pattern based Access Control Scheme for Wireless Insulin Pump System.” *In Proc. of IEEE INFOCOM 2013*, 2013. [paper]
15. [ICC2013] **Xiali Hei**, Xiaojiang Du, and Shan Lin. “Two Vulnerabilities in Android OS Kernel.” *In Proc. of*

IEEE ICC 2013, 2013. [\[paper\]](#)

14. **[ICC2012-1]** Xiali Hei, Xiaojiang Du, and Shan Lin. “Two Matrices for Blakleys Secret Sharing Scheme.” *In Proc. of IEEE ICC 2012*, 2012. [\[paper\]](#)
13. **[ICC2012-2]** Xiali Hei, Xiaojiang Du, and Shan Lin. “A Distributed Login Framework for Semi-structured Peer-to-Peer Networks.” *In Proc. of IEEE ICC 2012*, 2012. [\[paper\]](#)
12. **[INFOCOM2011]** Xiali Hei, Xiaojiang Du. “Biometric-based Two-level Secure Access Control for Implantable Medical Devices during Emergencies.” *In Proc. of IEEE INFOCOM (mini-conference)*, 2011.2011 [\[paper\]](#)
11. **[GLOBECOM2010]** Xiali Hei, Xiaojiang Du, Jie Wu, Fei Hu. “Defending Resource Depletion Attacks on Implantable Medical Devices.” *In Proc. of IEEE GLOBECOM 2010*, 2010. [\[paper\]](#)

JOURNAL

10. **[ACCESS2019-1]** Yuan Ping, Bin Hao, Xiali Hei, Yazhou Tu, Xiaojiang Du, and Jie Wu. “Feature Fusion and Voiceprint Based Access Control for Wireless Insulin Pump Systems.” *IEEE ACCESS*, 2019. [\[pdf\]](#)
9. **[ACCESS2019-2]** Yuan Ping, Bin Hao, Huina Li, Yuping Lai, Chun Guo, Hui Ma, Baocang Wang, and Xiali Hei. “Efficient Training Support Vector Clustering with Appropriate Boundary Informations.” *IEEE ACCESS*, 2019. [\[pdf\]](#)
8. **[JCSSC2019]** Shiliang Zhang, Hui Cao, Zonglin Ye, Yanbin Zhang, Xiali Hei. “An outlier detection scheme for dynamical sequential datasets.” *Journal Communications in Statistics-Simulation and Computation*, 2019. [\[pdf\]](#)
7. **[TNNLS2018]** Shiliang Zhang, Hui Cao, Shuo Yang, Yanbin Zhang, Xiali Hei. “Sequential Outlier Criterion for Sparsification of Online Adaptive Filtering.” *IEEE Transactions on Neural Networks and Learning Systems*, 2018. Impact factor: 6.08 [\[pdf\]](#)
6. **[MPE2017]** Shiliang Zhang, Hui Cao, Yanbin Zhang, Lixin Jia, Zonglin Ye, Xiali Hei. “Data-Driven Optimization Framework for Nonlinear Model Predictive Control.” *Mathematical Problems in Engineering*, 2017. [\[pdf\]](#)
5. **[CILS2017]** Hui Cao, Yajie Yu, Yanbin Zhou, Xiali Hei. “Double outlyingness analysis in quantitative spectral calibration: Implicit detection and intuitive categorization of outliers.” *Chemometrics and Intelligent Laboratory Systems*, 2017. [\[pdf\]](#)
4. **[TPDS2014]** Xiali Hei, Xiali Hei, Xiaojiang Du, Shan Lin, Insup Lee, and Oleg Sokolsky. “Patient Infusion Pattern based Access Control Schemes for Wireless Insulin Pump System.” *IEEE Transactions on Parallel and Distributed Systems*, 2014. [\[pdf\]](#)

BOOK CHAPTER

3. **[IGI2019]** Bin Hao and Xiali Hei. “Voice Liveness Detection for Medical Devices.” *IGI*, 2019. [\[pdf\]](#)

BOOK

2. **[Book1]** Xiali Hei, Xiaojiang Du. “Emerging Security Issues in Wireless Implantable Medical Devices.” *Springer*, . 2013 [\[pdf\]](#)

DISSERTATION

1. **[DISS2014]** Xiali Hei. “Security issues and defense methods for wireless medical devices.” *Temple University*, 2014. [\[pdf\]](#)

TEACHING

Fall 2019: INFX 455 Cyber-physical System Security & CSCE 598 Special Topics

Fall 2018: CSCE 512 Computer Network Security

Spring 2018: CSCE 512 Computer Network Security
Spring 2017: Advanced Computer Network
Spring 2017: Computer Network
Fall 2016: Advanced Operating system
Fall 2016: Operating system
Spring 2016: Topics in Ethical Hacking (tons of hands-on various hacking methods)
Spring 2016: Advanced Computer Network (tons of new technology)
Fall 2015: Advanced operating system
Fall 2015: Operating system
Spring 2015: Computer Forensics
Spring 2015: Ethical Hacking
Spring 2015: Computer Science Basics
Fall 2014: Database Security
Fall 2014: Software Engineering Security
Fall 2014: Cloud Security
Fall 2014: Computer Science Basics

ACADEMIC SERVICES

Panelist:

- 1) NSF Cyber-physical System 2015
- 2) 2019 IEEE Senior Member Application Virtual Review Panel

Program Committee Member:

- 1) USENIX Security Symp. 2020
- 2) USENIX Security Symp. 2019
- 3) International Conference on Data Intelligence and Security (ICDIS 2019)
- 4) IEEE GLOBECOM 2013 & 2014 & 2015 & 2016 & 2017
- 5) IEEE CyberC 2014 & 2015 & 2016
- 6) IEEE ICC 2014 & 2015 & 2016 & 2017 & 2018
- 7) IEEE ICCVE 2013 & 2014 & 2015 & 2016
- 8) IEEE ICACCI 2014
- 9) IEEE WASA 2016 & 2017

Editor of journals:

- 1) Assistant managing editor of JISTMSR (Journal of Information Systems and Technology Management for Specialized Research);
- 2) Guest editor of Special Issue Security Analytics and Intelligence for Cyber-Physical Systems for IEEE Access

Reviewer for journals:

- 1) IEEE Transactions on Wireless Communications
- 2) IEEE Transactions on Parallel and Distributed Systems
- 3) IEEE Wireless Communications Letters
- 4) IEEE Wireless Communications Magazine
- 5) International Journal of Ad Hoc and Ubiquitous Computing
- 6) Wiley Journal of Security and Communication Networks

INVITED TALKS

9. “Security of Wireless Medical Devices”, *University of Louisiana at Lafayette*, USA, 2017.
8. “Security of Wireless Medical Devices”, *Georgia State University*, USA, 2017.
7. “Security of Wireless Medical Devices”, *University of Idaho*, USA, 2017.
6. “Security of Wireless Medical Devices”, *Delaware State University*, USA, 2015.
5. “Security of Wireless Medical Devices”, *Fairleigh Dickinson University*, USA, 2015.
4. “Security of Wireless Medical Devices”, *Frostburg State University*, USA, 2014.
3. “Security of Wireless Medical Devices”, *Virginia Commonwealth University*, USA, 2014.
2. “Security of Wireless Medical Devices”, *Mary University*, USA, 2014.
1. “Security of Wireless Medical Devices”, *McMaster University*, Canada, 2013.

MENTORING, LEADERSHIP & ACTIVITIES

- Current Ph.D. students: Yazhou Tu, Md Imran Hossen, Md Nazmul Islam
- Current M.S. students: Md Fazle Rabby, Md Md Abdullah Al Momin
- Graduated M.S. students: Yazhou Tu, Jian Zhao, MichaelPeays