HONGYI ZHU

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EDUCATION & CERTIFICATIONS

The University of Arizona
Doctor of Philosophy (Ph.D.) **2014 – 2019 (expected)**
Advisor: Dr. Hsinchun Chen
Major: Management Information Systems
Minor: Cognitive Science

The University of Arizona
Certificate in College Teaching **2016 – 2017**

Tsinghua University
Bachelor of Science (B.S.) **2010 – 2014**
Major: Information Management and Information Systems
Minor: Computer Science

RESEARCH INTERESTS

1. **Domain**: Mobile Health Analytics – mobile sensor data mining and pattern recognition; Business Analytics – technology-related paper and patent analysis
2. **Methods**: Machine learning (deep learning), data mining, web mining, text mining, and visualization

DISSERTATION

Title: Developing Smart and Unobtrusive Mobile Home Care: A Deep Learning Approach
Committee: Dr. Hsinchun Chen (Chair), Dr. Sue Brown (Member), and Dr. Wei Chen (Member)
Dissertation Summary: Chronic conditions, frailty, dementia, and other diseases or symptoms significantly affect independent-living senior citizens' health, safety, and quality of life. The longevity of the aging population has resulted in a rocketing need for home care services. However, the insufficient labor supply of the home care market requests the involvement of modern information technology such as sensors, Internet of Things, and artificial intelligence. Healthcare providers and information systems researchers have sought to develop mobile home care approaches improve the home care effectiveness and efficiency. Given the societal importance of mobile home care, my dissertation aims to address four questions in the design science paradigm with Deep Learning frameworks:

- How to recognize residents' daily activities using smart home sensors?
- How can we use a minimum, unobtrusive sensor setting to extract the granular activity semantics?
- How can we recognize different residents within an environment to provide personalized care?
- How can we make use of mobile data to help identify and intervene early physical and cognitive impairments?

JOURNAL PUBLICATIONS

1. Samtani, S., **Zhu, H.** Yu, S. (Forthcoming). Fear Appeals and Information Security Behaviors: An Empirical Study on Mechanical Turk. *AIS Transactions on Replication Research (TRR)*.

2. **Zhu, H.**, Chen, H., Brown, R. (2018). A Sequence-to-Sequence Model-Based Deep Learning Approach for Recognizing Activity of Daily Living for Senior Care. *Journal of Biomedical Informatics (JBI)*, 84, 148-158.
3. Samtani, S., Yu, S., **Zhu, H.**, Patton, M., & Chen, H. (2018). Identifying Supervisory Control and Data Acquisition (SCADA) Devices and their Vulnerabilities on the Internet of Things (IoT): A Text Mining Approach. *IEEE Intelligence Systems*, 33, 63-73.
4. **Zhu, H.**, Jiang, S., Chen, H., & Roco, M. C. (2017). International perspective on nanotechnology papers, patents, and NSF awards (2000–2016). *Journal of Nanoparticle Research (JNR)*, 19(11), 370.

JOURNAL PUBLICATIONS UNDER REVIEW

1. **Zhu, H.**, Samtani, S., Brown, R., & Chen, H. A Deep Learning Approach for Recognizing Activity of Daily Living (ADL) for Senior Care: Exploiting Interaction Dependency and Temporal Patterns. Under review at *MIS Quarterly*.
2. Yu, S., **Zhu, H.**, Jiang, S., Zhang, Y., Xing, C., & Chen, H. Emoticon Analysis for Chinese Social Media and E-commerce: The AZEmo System. Revise and resubmit at *ACM Transactions on Management Information Systems (TMIS)*.

WORKING JOURNAL PUBLICATIONS

1. **Zhu, H.**, Chen, H. A Deep Transfer Learning Framework for Mobile Health: A Case for Activities of Daily Living Monitoring. Targeted at *Information Systems Research (ISR)*.
2. Wu, L., **Zhu, H.**, Chen, H. Comparing Nanotechnology Landscapes in US and China: A Patent Analysis Perspective. Targeted at *Journal of Nanoparticles Research (JNR)*.
3. Samtani, S., **Zhu, H.**, Chen, H. Graph Convolutional Autoencoders for Word, Sentence, and Document Embeddings. Targeted at *IEEE Transactions on Knowledge and Data Engineering (TKDE)*.

REFEREED CONFERENCE PROCEEDINGS (* PRESENTED)

1. Maimoon, L., Chuang, J., **Zhu, H.**, Yu, S., Peng, K. S., Prayakarao, R., Bai, J., Zeng, D., Li, S., Lu, H, & Chen, H. (2016, December). SilverLink: Developing an International Smart and Connected Home Monitoring System for Senior Care. In *International Conference on Smart Health* (pp. 65-77). Springer, Cham.
2. Samtani, S., Yu, S., **Zhu, H.**, Patton, M., & Chen, H. (2016, September). Identifying SCADA vulnerabilities using passive and active vulnerability assessment techniques. In *Intelligence and Security Informatics* (ISI), 2016 IEEE Conference on (pp. 25-30). IEEE.
3. Chuang, J., Maimoon, L., Yu, S., **Zhu, H.**, Nybroe, C., Hsiao, O., Li, S., Lu, H., & Chen, H. (2015). SilverLink: Smart Home Health Monitoring for Senior Care. In *Smart Health* (pp. 3-14). Springer.
4. Yu, S., ***Zhu, H.**, Jiang, S., & Chen, H. (2014). Emoticon Analysis for Chinese Health and Fitness Topics. In *Smart Health* (pp. 1-12). Springer.

TALKS AND PRESENTATIONS

1. A Deep Learning Method to Recognize Interactions Between Wearable and Environment Sensors (Poster Session). University of Arizona BIO5 Workshop on Biomedical Wearables. Tucson, Arizona, United States, 2016.
2. Global Nanotechnology Development: Nano 1 (2000-2010) vs. Nano 2 (2011-2014) (Poster Session). 2015 NSF Nanoscale Science and Engineering Grantees Meeting. Arlington, Virginia, United States, 2015.
3. Emoticon Analysis for Chinese Social Media and E-commerce: The AZEmo System. Tsinghua-University of Arizona Ecommerce Workshop. Tucson, Arizona, United States, 2015.

GRANT WRITING EXPERIENCE

1. EAGER: A Longitudinal Study of Knowledge Diffusion and Societal Impact of Nanomanufacturing Research & Development: Harnessing Data for Science and Engineering. **Funding Source:** National Science Foundation. **Year**: 2018. **Funding Amount:** $160,000. **Status:** Awarded. **Role:** Primary Grant Writer.
2. STTR Phase II: Advanced Analytics for Health Progression Monitoring and Fall Detection in a Novel Home Health Monitoring System. **Funding Source:** National Science Foundation. **Year**: 2017. **Funding Amount:** $750,000. **Status:** Declined. **Role:** Assisting Grant Writer.
3. STTR Phase I: Advanced Analytics for Health Progression Monitoring and Fall Detection in a Novel Home Health Monitoring System. **Funding Source:** National Science Foundation. **Year**: 2016. **Funding Amount:** $225,000. **Status:** Awarded. **Role:** Assisting Grant Writer.

TEACHING EXPERIENCE

Instructor

University of Arizona – **MIS 373 "Basics Operations Management"** **Summer 2018**

- Class size: 29
- Overall Rating of Teaching Effectiveness: **4.54 / 5.00**

University of Arizona – **MIS 373 "Basics Operations Management"** **Summer 2017**

- Class size: 23
- Overall Rating of Teaching Effectiveness: **2.55 / 5.00**
- Evening undergraduate program

Teaching Assistant

Tsinghua University – **"Computer Programming Language"** **Spring 2013**

- In charge of office hours, grading, and lab sessions

PROFESSIONAL AFFILIATIONS

1. Association of Information Systems (AIS), Student Member
2. Association of Computing Machinery (ACM), Student Member
3. Institute of Electrical and Electronics Engineers (IEEE), Student Member
4. Institute for Operations Research and the Management Sciences (INFORMS), Student Member

PROFESSIONAL SERVICES

1. **Session Chair** – INFORMS Annual Meeting. Session Title: "Healthcare Analytics: Deep Learning Approaches for Health Data." 2018. Phoenix, Arizona, United States.
2. **Reviewer** – INFORMS Workshop on Data Science, 2018. Phoenix, Arizona, United States.
3. **Reviewer** – International Conference on Smart Health (ICSH), 2018. Wuhan, China.
4. **Volunteer** – IEEE Intelligence and Security Informatics (ISI), 2016. Tucson, Arizona, United States.

AWARDS

1. Doctoral Consortium, American Conference on Information Systems (AMCIS). 2018.
2. Comprehensive Scholarship – Hongqian Scholarship, Tsinghua University. 2013.

PROFESSIONAL WORKING EXPERIENCE

- **Artificial Intelligence (AI) Lab, University of Arizona** **2014 – Current**
  Research Associate
- **International Smart Health Center (ISHC), Tsinghua University, China** **2013 – 2014**
  Research Fellow
- **Pactera Technology International Ltd., Beijing, China** **Summer 2013**
  Summer Intern

RELEVANT SKILLS

1. **Programming Languages:** Python, Java, Android, SQL, PL/SQL, C, C++, R, Perl
2. **Databases:** MySQL, SQL Server, PostgreSQL, Oracle, Access
3. **Middleware & Mobile App Development:** Mobile Home Monitoring & Data Collection System (Cloud database and service, Android gateway, and Bluetooth-enabled mobile sensors)
4. **Web Development:** HTML, CSS, Javascript, jQuery
5. **Data Mining Tools:** Weka, RapidMiner, SPSS Modeler
6. **Visualization Tools:** Gephi, Tableau, VTK, OpenFramework, Processing, D3.js, Sci2
7. **Cybersecurity Tools:** Shodan, NMap
8. **Operating Systems:** Windows, Linux
9. **Big Data Tools:** Hadoop, Spark

PROFESSIONAL REFERENCES

1. Hsinchun Chen, Ph.D. (Dissertation Committee Chair)
Regents' Professor and Thomas R. Brown Chair of Management and Technology
Director, Artificial Intelligence Lab
Eller College of Management, The University of Arizona
1130 E. Helen St., McClelland Hall 430X
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2. Sue Brown, Ph.D. (Dissertation Committee Member)
McClelland Professor of MIS
Management Information Systems Department Head
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3. Wei Chen, Ph.D. (Dissertation Committee Member)
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4. Randall Brown, M.D., MBA
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5. Eyran Gisches, Ph.D.
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