

Arthur Huang, Ph.D., LEED AP

Assistant Professor
Urban Resilience Initiative Faculty
Rosen College of Hospitality Management
College of Engineering and Computer Science (joint appointment)
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Research Interests

Artificial intelligence, big data analytics, AR/VR, sustainability, and future of work

Teaching Interests

Machine learning, health data analytics, data visualization, wearable devices, and complex systems

Education

Ph.D. in Civil Engineering (Transportation Data Analysis), University of Minnesota, 2014
Dissertation: Accessibility, Network Structure, and Consumers' Destination Choice: A Microscopic Analysis of GPS Travel Data
Award: ITS MN Best Paper Award and NCITE Best Paper Award
M.A. in Urban and Regional Planning, University of Minnesota, 2012
Concentration: Transportation Policy
M.S. in Software Engineering, Tsinghua University, Beijing China, 2007
Concentration: Machine learning
Santa Fe Institute Complex Systems Summer School, 2006
Graduate paper: Optimization and visualization of Chinese airline networks
B.S. in Mechanical Engineering, Beihang University, Beijing, China, 2004

Employment History

Tenure-track Assistant Professor, Smart City Initiative, Rosen College of Hospitality, University of Central Florida, Orlando, FL (August 2018 -Present)
Tenure-track Assistant Professor, Department of Civil Engineering, Tarleton State University (Texas A&M University-Stephenville), Texas (August 2014 - July 2018)
Research Intern, Center for Clean Air Policy, Washington, DC (2010 summer)
Project: Developing a time-series model to predict national greenhouse gas emissions trends.

Recognition and Awards

- UCF Rosen College Hero Award (2020)
- UCF Knighted Faculty (2020)
- UCF High Impact Practice (HIP) Course Designation Award (2020)
- ITS MN Best Paper Award, 2012
- North-Central Section Institute of Transportation Engineers Best Paper Award, 2012
- Babak Armajani Prize for Excellent Graduate Students, University of Minnesota, 2010
- Midwestern District ITE Best Graduate Student Paper Award, 2010
- Best Graduate Student Paper Finalist Award, North American Regional Science Council, 2009
- NCITE Graduate Student Fellowship, 2008
- Graduate Fellowship for Technical University of Munich Summer School, 2007
- Graduate Fellowship for Santa Fe Institute Complex Systems Summer School, 2006

- Tsinghua Friend-GE Graduate Scholarship, Tsinghua University, 2005

Licensure and Skills

LEED Accredited Professional, Java, Python, R, SAS, SPSS, Sketchup, and GIS, academic and research leadership

Grants and Research Projects

Under review

- Integrating wearable devices and big data analytics to reduce workplace injuries for nurses. Co-PI. \$250,000. NIH R03 (2021-2023).
- Leveraging AI and virtual reality for soft skill development in STEM careers. \$830,000. Sole PI. NSF CAREER (2021-2026).
- Collaborative Research: Toward a new Future of Work Theory. \$600,000, PI, NSF (2021-2024).
- Smart Cities Initiative: Towards Developing Smart Stakeholders for Smart Urban Systems in Madhya Pradesh. 348,801. Co-PI. State of Madhya Pradesh, India (2021-2023).

Externally funded

- RAISE: C-Accel Pilot - Track B1: Prepare the US labor force for future jobs in the hotel and restaurant in industry: A hybrid framework and multi-stakeholder approach. \$1 million. PI. National Science Foundation (2019-2022).
- Digital Customer Discovery. Mazda Corporation. \$50,000. Co-PI. (2020-2021).

Internally funded

- Connecting Residents Experiencing Homelessness during Disasters and Emergency Situations. UCF Office of Research Seed Funding IR 1. \$55,000. PI (2020-2022; university-wide success rate: <10%).
- Analytics-Driven Pathway Toward Resilient Tourism Ecosystems. \$10,000. PI. UCF Rosen College Cluster Research Grant (2020-2021).
- AEER: Investigating the Geography of Subjective Well-being: A Big Data Perspective. \$7500, PI. UCF Office of Research (2019-2020).
- Will Artificial Intelligence Take My Job? Development of Multidimensional Employment Impact Indices of AI in the Service Industry. \$10,000. PI. UCF Rosen College Cluster Research Grant (2018-2019).

Not selected for funding

- RAISE: Preparing America's vulnerable workers for the future of work. \$5,000,000. PI. NSF (2020)
- Collaborative Research: ACT: Agile Cross-industry Transfer. cross-industry career transition strategies. \$250,000. Co-PI. NSF (2020).
- SCC-CIVIC-PG Track B: DORIE: Data Opportunity for Resilience, Impact, and Equity. National Science. \$150,000. PI. NSF (2020).
- WE-RISE: Workforce Empowerment and Retraining. \$500,000. Co-PI. NSF (2019).
- Toward Fair, Ethical, Efficient, and Trustworthy Crowdsourcing to Support Jobs of the Future. \$500,000, Co-PI. NSF (2019).
- Building a Real-Time Crowd-Sourced Information System. \$125,000. Co-PI. Facebook Research (2019).
- A Deep-learning and Blockchain-based skilling platform. \$1,176,000. Co-PI. NSF (2019).
- Identifying and Tracking Emerging Transportation Trends and Indicators. \$149,000, Co-PI. FL Department of Transportation (2018).
- Mitigating Vulnerabilities in the Tourism Industry to Enhance Community Resilience on Florida's Gulf Coast. \$1,965,647, Co-PI. NSF (2018).
- Investigating Tourism's Differential Impacts on Community Residents' Social Welfare Using Big Data Analytics. \$922,060. PI. Google Research (2018).
- The Geography of Emotions: Social Media Data and Urban Travel Analytics, \$250,000, PI. NSF (2018).

Selected Publications

Peer-Reviewed Articles (* supervised postdoc; ^ graduate student; □ undergraduate student)

1. ^ Farhangi, A. ^ Bian, J., **Huang, A.**, Xiong, H., Wang, J., and Guo, Z.(2021). Anomaly-Aware Recurrent Neural Networks. *Proceedings of the 21st IEEE International Conference on Data Mining (ICDM 2021)* (acceptance rate: 19%).
2. ^ Farhangi, A. ^ Bian, J., **Huang, A.**, and Guo, Z.(2021). A Novel Deep Learning Model For Hotel Demand and Revenue Prediction amid COVID-19. *Proceedings of Hawaii International Conference on System Sciences (HICSS)* (acceptance rate: 51%).
3. ^ Farhangi, A. ^ Bian, J., **Huang, A.**, and Guo, Z.(2021). Time Series Prediction with Anomaly-Aware Recurrent Neural Networks. *The Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI)* (under review).
4. ^ Farhangi, A. ^ Bian, J., **Huang, A.**, and Guo, Z.(2021). Protoformer: Embedding Prototypes for Transformers. *The 26th Pacific-Asia Conference on Knowledge Discovery and Data Mining* (under review).
5. **Huang, A.** , ^ Fisher, T., & Guo, Z. (2021) What is my next move? A network analysis of cross-sector skill transferability for the hospitality industry. *International Journal of Contemporary Hospitality*.
6. **Huang, A.** (2021). A network model of happiness at destinations. *Tourism Analysis*.
7. **Huang, A.**, ^ Chao, Y., * de la Mora Velasco, E., Bilgihan, A., & Wei, W. (2021). When artificial intelligence meets the hospitality and tourism industry: an assessment framework to inform theory and management. *Journal of Hospitality and Tourism Insights*.
8. **Huang, A.** *Jahromi, M. & ^Maquez, V. (2021). Customers' Behavioural Immune System Responses to the COVID-19 Pandemic: A conceptual framework. *European Journal of Tourism Research*.
9. Brown, C. E., Alvarez, S., Eluru, N., & **Huang, A.** (2021). The economic impacts of tropical cyclones on a mature destination, Florida, USA. *Journal of Destination Marketing & Management*, 20, 100562.
10. **Huang, A.**, & *Farboudi Jahromi, M. (2020). Resilience building in service firms during and post COVID-19. *The Service Industries Journal*, 1-30.
11. Hua, N., **Huang, A.**, ^Medeiros, M., & DeFranco, A. (2020). The moderating effect of operator type: the impact of information technology (IT) expenditures on hotels' operating performance. *International Journal of Contemporary Hospitality Management*.
12. **Huang, A.**, Makridis, C., ^Baker, M., ^Medeiros, M., & Guo, Z. (2020). Understanding the impact of COVID-19 intervention policies on the hospitality labor market. *International Journal of Hospitality Management*.
13. ^Bian, J., Wang, W., Zhang, X., Wang, W., **Huang, A.**, & Guo, Z. (2019). On Generating Dominators of Customer Preferences. In *Proceedings of 2019 IEEE International Conference on Big Data (Big Data)* (pp. 2177-2186). IEEE. (acceptance rate: 17%).
14. **Huang, A.**, & Levinson, D. (2017). A model of two-destination choice in trip chains with GPS data. *Journal of choice modelling*, 24, 51-62.
15. **Huang A.**, ^Ebert D., ^Rider P. (2017) You Are What You Tweet: A New Hybrid Model for Sentiment Analysis. In: *Machine Learning and Data Mining in Pattern Recognition. MLDM 2017. Lecture Notes in Computer Science*, vol 10358. Springer (acceptance rate: 20%).
16. **Huang, A.**, Gallegos, L., and Lerman, K. (2017) Travel analytics: Understanding how destination choice and business clusters are connected based on social media data. *Transportation Research Part C: Emerging Technologies* 77: 245-256.
17. **Huang, A.**, & Levinson, D. (2015). Axis of travel: Modeling non-work destination choice with GPS data. *Transportation Research Part C: Emerging Technologies*, 58, 208-223.
18. Gallegos, L., Lerman, K., **Huang, A.**, and Garcia, D. (2016) Geography of Emotion: Where in a City are People Happier? *Proceedings of the ACM International World Wide Web Conference (IW3C2)*: 569-574 (acceptance rate: 18%).
19. Chi, G., Quddus, M. A., Huang, A., & Levinson, D. (2013). Gasoline price effects on traffic safety in urban and rural areas: Evidence from Minnesota, 1998–2007. *Safety Science*, 59, 154-162.

20. **Huang, A.** and Levinson, D. (2013) The Structure and Evolution of a Skyway Network. *The European Physical Journal: Special Topics on Complex Networks* 251(1): 123-134.
21. Levinson, D. and **Huang, A.** (2012) A Positive Theory of Network Connectivity. *Environment & Planning B* 39 (2): 308-325.
22. Cao, X., Xu, Z., and **Huang, A.** (2012) Safety Benefits of Converting HOV lanes to HOT lanes: Case Study of the I-394 MnPass. *The ITE Journal*, 82(2): 32-37.
23. **Huang, A.** and Levinson, D. (2010) Why Retailers Cluster: An Agent Model of Location Choice on Supply Chains. *Environment & Planning B* 38 (1): 82-94.
24. **Huang, A.** and Levinson, D. (2010) The Effects of Daylight Saving Time on Vehicle Crashes in Minnesota. *Journal of Safety Research* 41(6): 513-520.
25. **Huang, A.** & Levinson, D. (2009) Retail Location Choice with Complementary Goods: An Agent-Based Model. *Complex Sciences: Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering*, 4:175-187.

Peer-Reviewed Book Chapters

1. Levinson, D. and **Huang, A.** (2021). Non-work Vehicle Trip Generation from Multi-week In-vehicle GPS Data *Applications of Access*, University of Sydney.
2. ^ Baker, M. and **Huang, A.** (Forthcoming, 2022). Com. In Hancer, M. and Ozturk (ed). *Extended Reality and Gamification in Destination Marketing Organizations: Current Perspectives and Future Opportunities*. In *Digital Marketing and Social Media Strategies for Tourism & Hospitality Organizations*.
3. **Huang, A.** and Levinson, D. (2012) *STREET: Where Simulation Meets the Reality*. In A.H. Duin, E. Nater, and F. Ankesaria (Eds.). *Cultivating Change in the Academy: 50+ Stories from the Digital Frontlines at the University of Minnesota in 2012*. The University of Minnesota.

Encyclopedia (^ graduate student)

Huang, A. & ^Bahja, F. (2020). *Complex Systems*. Encyclopedia of Tourism Management and Marketing (Editor: D. Buhalis) Edward Elgar Publishing.

Industry Publications (^ graduate student)

Huang, A. and ^ Baker, M.(2021) COVID-19: a ‘perfect storm’ for the hospitality sector. *Rosen Research Review*.
Huang, A. (2021). Preparing the Tourism Workforce for the Future of Work. *Rosen Research Review*.

Conference Reports

Huang, A. (2019). The First International Conference on Smart Tourism, Smart Cities, and Enabling Technologies (the Smart Conference). *Anatolia*, 30(3), 431-433.

Book Reviews

Huang, A. (2009) Book review of the Code and the City. *Journal of Transport and Land Use* 2(2): 79-81.

Teaching

University of Central Florida

Graduate Level Quantitative/AI courses:

- HMG 6738: Tourism Industry Analysis (spring of 2019-2021) – High Impact Course Designation
- HMG 6449: Smart Travel Technologies (fall of 2018-2011) – High Impact Course Designation
- CGN 4309: Introduction to Smart Cities (fall 2019; fall 2020; co-instructor)
- Served as a core team member in developing a new M.S. in Travel Technology and Analytics at UCF

Tarleton State University

- CVEN 2235: Civil Engineering Statistics (fall of 2014-2017)
- CVEN 4450 : Transportation Engineering (spring of 2014-2017)
- CVEN 4360 : Highway Planning and Design (spring of 2014-2017)

Completed pedagogical training and innovation

- Contemplative Teaching Practices Course Innovation Cohort (spring 2021)
- High-impact Course Redesign Bootcamp: Integrative learning (summer 2020)
- Enhancing Integrative Learning at UCF Cohort: Creating Resources and Sharing Expertise (spring 2019)
- HQR4444 - High Quality Online or Blended Course Review Training (fall 2020)
- Winter Faculty Development Conference (2019, 2020)
- Summer Faculty Development Conference (2019, 2020)
- IDL6543 - UCF Teaching online Certificate (2018)
- Applied Learning Experience (ALE) Design Cohort (Texas A&M University) (2017)

Selected Invited Talks

1. Huang, A. (2021). Business Intelligence in the post-COVID 19 world. Invited keynote speech. 6th World Research Summit for Hospitality and Tourism.
2. Huang, A. (2020). Leading Through Technology, Innovation, and Change Management. UCF Research Recovery & Reskill Webinar Series No.5.
3. Huang, A. (2019). The future of work in the services industry. Testified before the Florida House of Representatives, November 2019.
4. Huang, A. (2019). The future of work of the tourism industry. Testimony at the Florida House of Representatives Tourism & Workforce Development Committee, Tallahassee, Florida, Nov 23, 2019.
5. Huang, A. (2019). Blockchain technology for the tourism industry. Invited Talk at Global Smart Cities Blockchain Conference, Orlando, FL.
6. Huang, A. (2019). Smart City and Emergent Technologies. Invited talk at Indian-American Chamber of Commerce. Orlando, FL, Oct. 2019.
7. Huang, A. (2018). Smart City: Methods, Technologies, and Case Studies. Invited speech at the Structures Congress 2019, Orlando, FL.
8. Huang, A. (2017). The Geography of Emotions: Social Media Data and Urban Environment. Invited Research Seminar. Department of Civil and Environmental Engineering, University of Missouri-Columbia, MO, April 2017.

Developed Software

- **Huang, A.** and D. Levinson (2012) ANGIE: Agent-based Network Growth model with Incremental Evolution. Available from <http://street.umn.edu/ANGIE/NetworkGrowth.html>
- **Huang, A.** and D. Levinson (2010) CLUSTER (Clustered Locations of Urban Services, Transportation, and Economic Resources): An agent-based simulation module for retail location choice. Available from <http://www.street.umn.edu/CLUSTER.html>

Service and Leadership

Service to the State of Florida

1. Testified before the Florida House of Representatives on the future of work in the tourism industry in November of 2019.
2. Advised Florida House Representative Mr. Rene Plasencia (District 49) on developing strategies to strengthen STEM education in Central Florida (2019-2020).
3. Served Deputy Director of Workforce Services at Florida Department of Economic Opportunity by sharing ideas about workforce development opportunities in Florida for the future of work (2019).

Service to the University of Central Florida

1. Currently serving as faculty mentor for UCF Office of Research to support faculty applying for the NSF grants through the NSF Pitch and Writing Circles Program.
2. Participated in the roundtable discussion on Orlando Airport Cooperative Project Vision organized by UCF Office of the President (2020).
3. Currently serving as a faculty member of the UCF AR/VR working group: an initiative for developing mixed-reality and digital twins technologies with broad real-world applications.
4. Currently serving as a faculty member of the UCF Urban Resilience Initiative: an interdisciplinary collaborative effort to study urban sustainability and resilience.
5. Currently serving as a member of UCF Smart City Research Cluster on developing technology-driven solutions in urban management.
6. Contributed to the development of M.S. in Civil Engineering Smart City Track as part of the faculty working group.

Professional Service

Editor for Special Issues

- Journal of Destination and Marketing and Management (Special Issue on Big data & Smart Tourism)

Editorial Board Member

- Journal of Computations and Materials in Civil Engineering
- International Journal of Hospitality and Tourism Insights

Conference Organization

- The 8th World Conference on Structural Control and Monitoring (2022).
- The 5th World Research Summit for Tourism and Hospitality (2019)
- The 1st International Conference on Smart Tourism, Smart Cities, and Enabling Technologies (2019)

Media Coverage of Research

1. Future of Work Research at the UCF. [UCF Research Annual Report](#) (2019).
2. [NSF Funds UCF Study to Explore AI Impact on Hospitality Industry](#). *UCF Today*, Oct. 31, 2019.
3. Daylight saving time: the first sign of spring. *StarTribune Newspaper*, Minneapolis, March 9, 2014.
4. Games in the classroom: teaching transportation planning with board games. [Catalyst](#), University of Minnesota, 2013.
5. Can daylight saving time save lives? John Hines Show on WCCO Radio, Nov. 5, 2010.