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Professional Experience

University of Massachusetts Boston <i>Associate Professor</i>	Boston, MA <i>2022 - Present</i>
University of Massachusetts Boston <i>Assistant Professor</i>	Boston, MA <i>2016 - 2022</i>
Missouri University of Science and Technology <i>Research Assistant</i>	Rolla, MO <i>2012 - 2016</i>
Missouri University of Science and Technology <i>Software Engineer</i>	Rolla, MO <i>2012 - 2014</i>
Product Innovation and Engineering <i>Senior Software Engineer</i>	St. James, MO <i>2012 - 2014</i>
University of Mines and Technology <i>Assistant lecturer</i>	Tarkwa, Ghana <i>2011 - 2011</i>

Education

Missouri University of Science and Technology <i>Ph.D. in Computer Science</i>	Rolla, MO <i>2012 - 2015</i>
Missouri University of Science and Technology <i>M.S. in Computer Science</i>	Rolla, MO <i>2009 - 2010</i>
Kwame Nkrumah University of Science and Technology <i>B.S. in Computer Science</i>	Kumasi, Ghana <i>2002 - 2006</i>

Ph.D. Dissertation

Title: Methods and Algorithms for Service Selection and Recommendation – Preference and Aggregation Based.

Advisor: Dr. Xiaoqing “Frank” Liu

Research Interests

General interests:

Recommender Systems, service and cloud computing, software engineering, machine and deep learning, and metal additive manufacturing.

Specific interests include: Personalized recommender systems (RS), knowledge graphs for RS, preference based service selection, 3D toolpath recommendation, 3D part families detection in additive manufacturing, and metal additive manufacturing simulations.

Peer-Reviewed Journal Articles

- [J1] X. Xie, J. Liu, B. Cao, M. Peng, G. Kang, Y. Wen, **K.K. Fletcher**, “A Services Classification Method Based on Heterogeneous Information Networks and Generative Adversarial Networks”, *International Journal of Web Services Research (IJWSR)*, 2023 20 (1), 1-17.
- [J2] B. Cao, M. Peng, Y. Qing, J. Liu, G. Kang, B. Li, **K.K. Fletcher**. ”Web API recommendation via combining graph attention representation and deep factorization machines quality prediction”, *Concurrency Computat Pract Exper.*”, 2022.
- [J3] **K.K. Fletcher**, “A Method for Aggregating Ranked Services for Personal Preference Based Selection”, *International Journal of Web Services Research (IJWSR)*, 2019 16.2, 1-23.
- [J4] **K.K. Fletcher**, X.F. Liu and M. Tang, “Elastic Personalized Non-Functional Attribute Preference and Trade-off based Service Selection”, *ACM Transactions on the Web*, 2015 9 (1), 1-26.
- [J5] V.P. Modekurthy, X.F. Liu, **K.K. Fletcher**, and M.C. Leu, “Design and Implementation of a Broker for Cloud Additive Manufacturing Services”, *Journal of Manufacturing Science and Engineering*, 2015.
- [J6] F. Liou, J. Newkirk, Z. Fan, T. Sparks, X. Chen, **K.K. Fletcher**, J. Zhang, Y. Zhang, K.S. Kumar, and S. Karnati, “Multiscale and Multiphysics Modeling of Additive Manufacturing of Advanced Materials”, *NASA scientific and technical information (STI)*, 2015.

Peer-Reviewed Conference Articles

- [C1] D. Alao, E. Hamrick, S. Bhat, A. Sen, **K.K. Fletcher**, “An IoT Simulator Tool for Provisioning Secure and Dynamic User-centric Services”, *Internet of Things–ICIOT 2022: 7th International Conference, Held as Part of the Services Conference Federation, SCF 2022*, Honolulu, HI, USA, December 10–14, 2022,
- [C2] B. Kwapong, A. Sen, **K.K. Fletcher**, “ELECTRA-KG: A Transformer-Knowledge Graph Recommender System”, *Services Computing–SCC 2022: 19th International Conference, Held as Part of the Services Conference Federation, SCF 2022* Honolulu, HI, USA, December 10–14, 2022.
- [C3] B. Amankwata, **K.K. Fletcher**, “Context Preserving Data Augmentation for Sequential Recommendation”, *Services Computing–SCC 2022: 19th International Conference, Held as Part of the Services Conference Federation, SCF 2022* Honolulu, HI, USA, December 10–14, 2022.
- [C4] R. Anarfi, A. Sen, **K.K. Fletcher**, “Boosting Item Coverage in Session-Based Recommendation”, *Services Computing–SCC 2022: 19th International Conference, Held as Part of the Services Conference Federation, SCF 2022* Honolulu, HI, USA, December 10–14, 2022.
- [C5] B. Amankwata and **K.K. Fletcher**, “Contexts Embedding for Sequential Service Recommendation”, *5th International Workshop on Advances in Artificial Intelligence and Machine Learning (AIML 2022): Towards Trustworthy AI in collaboration with 2022 IEEE 46th Annual Computers, Software, and Applications Conference (COMPSAC)*, 2022.
- [C6] Y. Qing, B. Cao, M. Peng, L. Zhang, G. Kang, J. Liu, **K.K. Fletcher**, ”AMSC: Adaptive Multi-channel Graph Convolutional Network-Enhanced Web Services Classification,” In *2021 IEEE 23rd Int Conf on High Performance Computing & Communications; 7th Int Conf on Data Science &*

Systems; 19th Int Conf on Smart City; 7th Int Conf on Dependability in Sensor, Cloud & Big Data Systems & Application (HPCC/DSS/SmartCity/DependSys), 2021, pp. 205-212.

- [C7] L. Zhang, B. Cao, M. Peng, Y. Qing, G. Kang, J. Liu, **K.K. Fletcher**, "Bilinear Graph Neural Network-Enhanced Web Services Classification," In *2021 IEEE 23rd Int Conf on High Performance Computing & Communications; 7th Int Conf on Data Science & Systems; 19th Int Conf on Smart City; 7th Int Conf on Dependability in Sensor, Cloud & Big Data Systems & Application (HPCC/DSS/SmartCity/DependSys)*, 2021, pp. 189-196.
- [C8] O. Oyeniyi, S.S. Dhandhukia, A. Sen and **K.K. Fletcher**, "A Study of AI Frameworks for Major Depressive Disorder Diagnosis", *2021 International Workshop on AI-enabled Process Automation*, 2021.
- [C9] R. Anarfi, B.A. Kwapong, **K.K. Fletcher**, Todd Sparks, Aaron Flood, and Mugdha Joshi, "Inference of Metal Additive Manufacturing Process States via Deep Learning Techniques," In *2021 Annual International Solid Freeform Fabrication Symposium (SFF Symp)* 2021.
- [C10] R. Anarfi, B.A. Kwapong, and **K.K. Fletcher**, "Towards a Reinforcement Learning-based Exploratory Search for Mashup Tag Recommendation," In *2021 IEEE International Conference on Smart Data Services* [Accepted for publication].
- [C11] R. Anarfi, B.A. Kwapong and **K.K. Fletcher** "desc2tag: A Reinforcement Learning Approach to Mashup Tag Recommendation," In *IEEE International Conference on Services Computing*, Beijing, China, October 2020, pp. 475–477 (Conference acceptance rate 10.28%).
- [C12] B.A. Kwapong, R. Anarfi, and **K.K. Fletcher**, "A Knowledge Graph Approach to Mashup Tag Recommendation," In *IEEE International Conference on Services Computing*, Beijing, China, October 2020, pp. 92–99 (Conference acceptance rate 10.28%).
- [C13] E. Adeborna, and **K.K. Fletcher**, "An Empirical Study of Web API Quality Formulation," In *International Conference on Services Computing*, Honolulu, Hawaii, September 2020, pp. 145–153 (Conference acceptance rate 20.89%).
- [C14] **K.K. Fletcher**, "An Attention Model for Mashup Tag Recommendation," In *International Conference on Services Computing*, Honolulu, Hawaii, September 2020, pp. 50–64 (Conference acceptance rate 20.89%).
- [C15] B.A. Kwapong, R. Anarfi and **K.K. Fletcher**, "Collaborative Learning Using LSTM-RNN for Personalized Recommendation," In *International Conference on Services Computing*, Honolulu, Hawaii, September 2020, pp. 35–49 (Conference acceptance rate 20.89%).
- [C16] A. Sen, **K.K. Fletcher**, and S. Madria, "A Secure User-Centric Framework for Dynamic Service Provisioning in IoT Environments," In *IEEE International Conference on Trust, Security and Privacy in Computing and Communications*, Rotorua, New Zealand, August 2019, pp. 331–338 (Conference acceptance rate 28.67%).
- [C17] R. Anarfi and **K.K. Fletcher**, "A Reinforcement Learning Approach to Web API Recommendation for Mashup Development," In *IEEE World Congress on Services (SERVICES)*, Milan, Italy, July 2019, vol. 2642-939, pp. 372–373 (Conference acceptance rate 17.28%).

- [C18] B.A. Kwapong and **K.K. Fletcher**, “A Knowledge Graph based Framework for Web API Recommendation,” In *IEEE World Congress on Services (SERVICES)*, Milan, Italy, July 2019, vol. 2642-939X, pp. 115–120 (Conference acceptance rate 17.28%).
- [C19] **K.K. Fletcher**, “Regularizing Matrix Factorization with Implicit User Preference Embeddings for Web API Recommendation,” In *IEEE International Conference on Services Computing (SCC)*, Milan, Italy, July 2019, pp. 1–8. (Conference acceptance rate 10%).
- [C20] B.A. Kwapong, R. Anarfi and **K.K. Fletcher**, “Personalized Service Recommendation Based on User Dynamic Preferences” In *Lecture Notes in Computer Science - Services Computing (SCC)*, San Diego, CA, June 2019, pp. 77-91.
- [C21] **K.K. Fletcher**, “A Quality-Aware Web API Recommender System for Mashup Development” In *Lecture Notes in Computer Science - Services Computing (SCC)*, San Diego, CA, June 2019, pp. 1-15.
- [C22] **K.K. Fletcher**, “A Quality-Based Web API Selection for Mashup Development Using Affinity Propagation.” In *Lecture Notes in Computer Science - Services Computing (SCC)*, Seattle, WA, June 2018, pp. 153-165. (Best paper award).
- [C23] **K.K. Fletcher**, “A Method for Dealing with Data Sparsity and Cold-Start Limitations in Service Recommendation using Personalized Preferences”, In *IEEE International Conference on Cognitive Computing (ICCC)*, Honolulu, HI, June 2017.
- [C24] **K.K. Fletcher**, T.E. Sparks, A. Flood and F. Liou, “A SOA Approach to Improve Performance of Metal Additive Manufacturing Simulations”, In *IEEE International Conference on Cognitive Computing (ICCC)*, Honolulu, HI, June 2017.
- [C25] **K.K. Fletcher**, and X.F. Liu, “A Collaborative Filtering Method for Personalized Preference-Based Service Recommendation,” In *IEEE International Conference on Web Services (ICWS)*, New York, NY, June 2015, pp.400-407 (Conference acceptance rate 17.4%).
- [C26] V.P. Modekurthy, **K.K. Fletcher**, X.F. Liu, and M.C. Leu, “Personal Preference and Trade-Off Based Additive Manufacturing Web Service Selection.” In *IEEE International Conference on Web Services (ICWS)*, New York, NY, June 2015, pp.440-447 (Conference acceptance rate 17.4%).
- [C27] **K.K. Fletcher**, X.F. Liu and M.X. Cheng, “Aggregating Ranked Services for Selection,” In *IEEE International Conference on Service Computing (SCC)*, Anchorage, AK, June 2014, pp.331-338, (Conference acceptance rate 19%).
- [C28] I. H. Selvi, T. O. Ozcelik, **K.K. Fletcher**, O. Iyibilgin, M.C. Leu, X.F. Liu, “A Framework and Prototype System for Cloud - Based Additive Manufacturing,” In *International Symposium on Flexible Automation (ISFA 2014)*, Awaji-Island, Hyogo, Japan, July 2014.
- [C29] X.F. Liu, **K.K. Fletcher**, and M. Tang. “Service Selection Based on Personalized Preference and Trade-Offs among QoS Factors and Price,” In *IEEE International Conference on Services Economics*, Honolulu, HI, June 2012, pp. 32-39, (Conference acceptance rate 17.6%).
- [C30] G. Kang, J. Liu, M. Tang, X.F. Liu, **K.K. Fletcher**, “Web Service Selection for Resolving Conflicting Service Requests,” In *IEEE International Conference on Web Services (ICWS)*, Washington, DC, July 2011, pp.387-394, (Conference acceptance rate 14%).

- [C31] **K.K. Fletcher** and X.F. Liu, “Security Requirements Analysis, Specification, Prioritization and Policy Development in Cyber-Physical Systems,” In *IEEE International Conference on Secure Software Integration & Reliability Improvement Companion (SSIRI-C)*, Jeju Island, Korea, June 2011, pp.106-113. (Conference acceptance rate 32.14%).

Book Chapter

- [B1] **K.K. Fletcher** and X.F. Liu, “Cloud Security Requirements Analysis and Security Policy Development using HOOMT” In *Cloud Computing: Methodology, System, and Applications*, 2011, Lizhe Wang, Boca Raton: CRC, Taylor & Francis Group.

Grants & Awards

- [G1] Defect Detection in Metal Additive Manufacturing - Phase I, \$139,880.00, Sub-Contract share \$45,000, U.S. Department of Defense (Navy), 11/09/2022 - 05/09/2023.
- [G2] Additive Manufacturing Simulator (AMS) - Phase II, \$1,000,000, Sub-Contract share \$100,000, U.S. Department of Energy, 04/10/2017 - 04/30/2020.
- [G3] Evaluating and Tuning “SurveyFy” – An Intelligent Survey Questionnaire Curation Application, \$12,000, PI, UMass Boston Healey Research Grant, 01/01/2018 – 12/31/2019.
- [G4] Additive Manufacturing Simulator (AMS) - Phase I, \$150,000, U.S. Department of Energy, 06/01/2016 - 12/31/2016.
- [A1] IEEE Technical Committee on Services Computing (TCSVC) Rising Star Award, 2020 [Nominated].
- [A2] Best paper award, International Conference on Services Computing (SCC), 2018.

Patent

- [P1] **K. K. Fletcher** and T. E. Sparks. 2017. “Additive Layering Method using Improved Build Description”. U.S. Patent 14/643,812, September 2017.

Presentations

- [Pr1] Conference Paper Presentation, IEEE International Conference on Smart Data Services (SMDS), Chicago, IL, September 2021.
- [Pr2] Invited Talk, Computer Science Faculty & Students, Ashesi University College, Berekuso, Ghana, April 2021.
- [Pr3] Conference Paper Presentation, IEEE International Conference on Services Computing (SCC), Beijing, China, September 2020.
- [Pr4] Invited Talk, Computer Science Faculty & Students, Department of Computer Science and Engineering, Oakland University, Rochester, MI, February 2020.
- [Pr5] Conference Paper Presentation, Springer International Conference on Services Computing (SCC), San Diego, CA, August 2019.

- [Pr6] Conference Paper Presentation, IEEE International Conference on Services Computing (SCC), Milan, Italy, July 2019.
- [Pr7] Research Symposium, Computing Community Consortium (CCC) Early Career Research Symposium, Washington DC, August 2018.
- [Pr8] Conference Paper Presentation, Springer International Conference on Services Computing (SCC), Seattle, WA, July 2018.
- [Pr9] Research Symposium, Computing Community Consortium (CCC) Computing Research Symposium, Washington DC, October 2017.
- [Pr10] Invited Talk, Computer Science Faculty & Students, Ashesi University College, Berekuso, Ghana, September 2017.
- [Pr11] Invited Talk, Computer Science Faculty & Students, University of Ghana, Accra, Ghana, August 2017.
- [Pr12] Conference Paper Presentation, IEEE International Conference on Cognitive Computing (ICCC), Honolulu, HI, June 2017.
- [Pr13] Career Workshop, Academic Careers Workshop for Underrepresented Participants, Houston, TX, April 2017.
- [Pr14] Invited Talk, Computer Science Faculty & Students, Department of Computer Science, Kent State University, Kent, OH, October 2016.

TEACHING

- [T1] Courses developed and taught at University of Massachusetts Boston
 - o CS682 Software Development Lab [Graduate].
 - o CS683 Software Development Lab II [Graduate].
 - o CS410 Intro to Software Engineering [Undergraduate].
 - o CS435/635 Recommender Systems [Graduate/ Undergraduate].
- [T2] Course developed and taught at Missouri University of Science and Technology
 - o Introduction to Programming with C++ [Undergraduate].

Professional Societies

- [S1] Institute of Electrical and Electronic Engineers (IEEE)
- [S2] IEEE Computer Society
- [S3] Association for Computing Machinery (ACM)

Professional Service: Department

- [PD1] Personnel Committee, Member (2019 – present)

- [PD2] Assessment Committee, Member (2019 – 2020)
- [PD3] Student Employment Committee, Member (2016 – 2020)
- [PD4] Budget Administrator Search Committee, Member (2018 – 2019)
- [PD5] Constitution Review and Amendments Committee, Member (2018 – 2019)
- [PD6] Seminar Committee, Coordinator (2016 – 2018)
- [PD7] PhD Committee, Member (2019)

Professional Service: College

- [PU1] College of Science and Mathematics (CSM) Senate, Secretary (2020 - present)

Professional Service: University

- [PU1] Academic Technology Committee, Member (2019 – present)

Professional Service: Discipline

- [PS1] Served as the chair for the 2023 IEEE Congress on Services Symposiums
- [PS2] Serving as a member of the ACM TWEB Distinguish Reviewer Board.
- [PS3] Served as Chair for the 2020 IEEE International Conference on Services Computing Scientific Workflows and BPM Track.
- [PS4] Serving as the Committee Chair of the IEEE Technical Committee on Services Computing (TCSVC) Young Experts on Services Computing (YESC) for North America (2020-2022).
- [PS5] Served as session chair for the following conferences:
 - o IEEE International Conference on Services Computing 2019, Resource Management Session.
 - o IEEE SERVICES Workshop on Knowledge Graphs as a Service 2019.
 - o IEEE International Conference on Cognitive Computing 2018.
- [PS6] Serving/Served as technical program committee member for the following conferences:
 - o IEEE International Conference on Smart Data Services (2020 – present).
 - o IEEE Workshop on Knowledge Graphs as a Service (2019 - present).
 - o IEEE International Conference on Services Computing (2015 – present).
 - o International Conference on Services Computing (2017 – present).
 - o International Conference on Building and Exploring Web Based Environments (2013 – 2015).
 - o IEEE International Conference on Web Services (2011 – 2015).
 - o Computer Software and Applications Conference (2010 – 2015).
 - o IEEE Cloud Computing Conference (2010).

[PS7] Serving as a reviewer for the following journals:

- IEEE Access (2018 - present).
- IEEE Transactions on Service Computing (2016 – present).
- IEEE Transactions on Network and Service Management (2016 – present).
- Journal of Systems and Software (2015).
- Journal of Manufacturing Science and Engineering (2015).

[PS8] Served as the Missouri University of Science and Technology IEEE Computer Society Student Membership Chair (2009 – 2010).