Hande Küçük McGinty

EDUCATION

PhD in Computer Science, May 2018. Department of Computer Science, University of Miami, Coral Gables, FL, USA.
Dissertation: KNowledge Acquisition and Representation Methodology (KNARM) and Its Applications
Fields of interest: Semantic Web Applications, Big Data Applications, Data Mining, ArtificialIntelligence, Bioinformatics, Querying and Visualization techniques in bioinformatics tools

M.S. in Computer Science, April 2010. Department of Computer Science,
Eastern Michigan University, Ypsilanti, MI, USA.
Thesis: A User Study of Attribute Visualization Tools and Their Role in Understanding Biological Networks
Fields of interest: Bioinformatics, Data Mining, Querying and Visualization techniques in bioinformatics tools.

B.S. in Computer Engineering, June 2007. Department of Computer Engineering,
Bilkent University, Ankara, Turkey.
Fields of interest: Bioinformatics and querying in bioinformatics tools.

WORK EXPERIENCE

Assistant Professor, August 2022 – current, Kansas State University, Department of Computer Science, Manhattan, KS, USA

Research Associate Professor, November 2020 — August 2022, Ohio University, Athens, OH, USA

Research Informatics Scientist, January 2017— November 2020, Collaborative Drug Discovery (CDD), Burlingame, CA, USA

Researcher, July 15, 2010 – July 15, 2011, Max Planck Institute for Informatics, Saarbrücken, Germany

Research and Teaching Assistant, August 15, 2011 – January 2017, University of Miami, Coral Gables,FL, USA

G*raduate Research Assistant*, January 7, 2008 – April 2010, Computer Science Department, EasternMichigan University, Ypsilanti, MI, US

Instructor, January 5, 2009 – April 29, 2009, Computer Science Department, Eastern Michigan University, Ypsilanti,MI, USA

Undergraduate Research Assistant, June 1, 2005 – July 1, 2007. Pathway Analysis Tools for Integration and Knowledge Acquisition Project, Bilkent University, Ankara, Turkey.

RESEARCH EXPERIENCE

Projects

- **FDC Ontology -** I am currently Designing and implementing the FDC Ontology at the USDA using the previously established KNARM methodology, a semi-automated ontology building process. FDC Ontology describes different food datasets and select properties of food that are highly used via the FDC website. Available dataset is on USDA's FDC website. The dataset includes mappings of "Foundation Foods" to "Food Ontology (FOODON)" URIs.
- **MInChI (Mixtures InChI):** As a part of CDD's SBIR Phase 2 grant related with Chemical Mixtures, and as a result of my training during the NIH I-CORPS (Spring 2019), I helped develop a better software for integrating standardized representations of chemical mixtures into our chemistry registration system (CDD Vault) and Electronic Lab Notebook (CDD ELN).

- **Ontolobridge –** As a result of this project a set of tools and methods that allow ontologies to evolve and change in a semi-automated way. It was an NIH funded U01grant, together with Stanford University, University of Miami, and CDD (https://ontolobridge.ccs.miami.edu/).

- **BioAssay Express –** BioAssay Express is a tool that allows hybrid annotation of bioassays, using public ontologies in the background with AI and ML methods to help human curators for better and faster annotations that are reusable in a machine-operable format (https://www.bioassayexpress.com/).

- **Illuminating the Druggable Genome (Drug Target Ontology) –** This is an NIH funded nationwide project that aims to encode the "dark matter" of the genome by using deep annotation to establish the roles of different and understudied proteins in diseases. It aims to help find new and better drugs for various diseases which are studied by different institutions such as Yale, Duke Universities and National Center for AdvancingTranslational Sciences (NCATS) (https://pharos.nih.gov/).

- **LINCS (Library of Integrated Cellular Signatures)** – This was a nationwide project which is funded by NIH. It aimed to understand how different cells have different signatures and how we can use them to find drugs for various diseases. We used semantic web technologies to formally define several different experiments conducted by different universities such as Harvard Medical School, Yale, Colombia University.

- **BioAssay Ontology (BAO)** – An ontology that formally describes bioassays by using

mathematical logic and semantic web technologies (https://bioportal.bioontology.org/ontologies/BAO) .

- **Opioid Dashboard –** OD is a new tool being built by Graham Technologies as a preventive tool to help with opioid addiction. I helped the tech team at Graham Technologies with the AI andML component for addiction prediction and prescription suggestions.

NIH funded projects

- RC2HG005668 (BioAssay Ontology and Software Tools to Integrate and Analyze Diverse Data Sets)
- 5U01HL111561-02 (LINCS Information FramEwork (LIFE) to Integrate and Analyze Diverse Data Sets)
- U54CA189205 (Illuminating the Druggable Genome Knowledge Management Center, IDG-KMC)
- U54HL127624 (BD2K LINCS Data Coordination and Integration Center, DCIC).
- 1U01LM012630-01 (Unifying Templates, Ontologies and Tools to Achieve Effective Annotation of Bioassay Protocols (OntoloBridge))
- 2R44TR000185-04 (BioAssay Express Phase 2)
- 3R43TR002528-01S1 (NIH I-CORPS Grant Supplement to SBIR Phase 1 Grant related with Chemical Mixtures)
- 2R44TR002528-02 (Digital Representation of Chemical Mixtures to Aid Drug Discovery and Formulation)

Publications

- Yinglun Zhang, Antonina Broyaka, Jude Kastens, Allen M. Featherstone, Cogan Shimizu, Pascal Hitzler, and **Hande Küçük Mcginty**. 2023. Sustainable Grain Transportation in Ukraine Amidst War Utilizing KNARM and KnowWhereGraph. In Companion Proceedings of the ACM Web Conference 2023 (WWW '23 Companion). Association for Computing Machinery, New York, NY, USA

- Nikita Gautam, David Shumway, Megan Kowalcyk, Sarthak Khanal, Doina Caragea, Cornelia Caragea, **Hande Mcginty**, and Samuel Dorevitch. 2023. Leveraging Existing Literature on the Web and Deep Neural Models to Build a Knowledge Graph Focused on Water Quality and Health Risks. In Proceedings of the ACM Web Conference 2023 (WWW '23). Association for Computing Machinery, New York, NY, USA, 4161–4171.

- Harrow, Ian, Rama Balakrishnan, **Hande Kucuk McGinty**, Tom Plasterer, and Martin Romacker. "Maximizing data value for biopharma through FAIR and Quality implementation: FAIR plus Q." *Drug Discovery Today*, 2022.

- Dooley, D., Weber, M., Ibanescu, L., Lange, M., Chan, L., Soldatova, L., Yang, C., Warren, R., Shimizu, C., McGinty, H.K. and Hsiao, W., 2022. Food process ontology requirements. *Semantic Web*, (Preprint), pp.1-32.

- Hammar, K., Shimizu, C., **McGinty, H.K**., Asprino, L. and Carriero, V.A., 2021. WOP 2021: Workshop on Ontology Design and Patterns 2021: Proceedings of the 12th Workshop on Ontology Design and Patterns (WOP 2021) co-located with the 20th International Semantic Web Conference (ISWC 2021), online, October 24, 2021. In *Proceedings of the 12th Workshop on Ontology Design and Patterns (WOP 2021) co-located with the 20th International Semantic Web Conference (ISWC 2021), online, October 24, 2021*. CEUR-WP.

- **Hande Kucuk McGinty**, et al.; Knowledge-graph integration of food products on the USDA's Food Data Central (FDC) using KARMA (Knowledge Acquisition and Representation Methodology (KNARM) and Its Application) for Connecting it to Global Food Systems (In Preparation)

- **Hande Küçük McGinty**, John Paul Turner, Alex M. Clark, Peter Gedeck, John Graybeal, Michael Dorf, Caty Chung, Mark Musen, Barry A. Bunin and Stephan Schürer; *OntoloBridge – A FAIR Semi-Automated Ontology Update Request System*; (In preparation)

- **Hande Küçük McGinty**, Ubbo Visser, Stephan Schurer ; How to Develop a Drug Target Ontology? *KNowledge Acquisition and Representation Methodology (KNARM) in Bioinformatics in Drug Discovery* (3rd Edition) (book), Springer Berlin/ Heidelberg / New York, 2019.

- **McGinty H.K.**, Lin, Y., Mehta, S, Turner, J.P., Vidovic, D., Forlin, M., Koleti, A., Nguyen, D.T., Jensen, L.J., Guha, R. and Mathias, S.L.,. "Drug target ontology to classify and integrate drug discovery data". *Journal of biomedical semantics*, *8*(1), pp.1-16. 2017.

- Vita, R., Zheng, J., Jackson, R., Dooley, D., Overton, J.A., Miller, M.A., Berrios, D.C., Scheuermann, R.H., He, Y., **McGinty, H.K**. and Brochhausen, M., 2021. Standardization of assay representation in the Ontology for Biomedical Investigations. *Database*, *2021*.

- Wuchty, S., Boltz, T. and **Küçük-McGinty, H.,** "Links between critical proteins drive the controllability of protein interaction networks". *Proteomics*, *17*(10), p.1700056. 2017.

- **Hande Küçük McGinty**, Saurabh Metha, Yu Lin, Nooshin Nabizadeh, Vasileios Stathias, Dusica Vidovic, Amar Koleti, Christopher Mader, Jianbin Duan, Ubbo Visser, and Stephan Schurer. It405: Building concordant ontologies for drug discovery. In International Conference on Biomedical Ontology and BioCre- ative (ICBO BioCreative 2016), Proceedings of the Joint International Conference on Biological Ontology and BioCreative (2016). ICBO and BioCreative, ICBO and BioCreative, 08/01/2016 2016.

- Abeyruwan S., Vempati U., **McGinty H.**, Visser U., Koleti A., Schührer S., "Evolving BioAssay Ontology (BAO): Modularization, Integration and Applications", Journal ofBiomedical Semantics 2014, 5(Suppl 1):S5.

- Fu, Gang and Batchelor, Colin and Dumontier, Michel and Hastings, Janna and **Kucuk, Hande** and Schurer, Stephan C and Vempati, Uma and Willighagen, Egon and Bolton, Evan: Semantic annotation of PubChem databases (article), 2013

- **H.Kucuk,** N.Millman, J. Baumbach, J.Weile, A.Wipat, "KeyPathwayMiner - Detecting case-specific biological pathways by using expression data", Int Math. 2011,7:4, 299-313.

Presentations

- Hande Kucuk McGinty, Torsten Hahmann, Cogan Shimuzu**, Same Data Different Methodologies For Building Knowledge Graphs;** TheWebConference, Austin, TX, May 2023.

- Hande Kucuk McGinty, **Maximizing Data Value for Biopharma Through KARMA and FAIR+Q; Nexus Informatics Conference**, Kansas City, KS, April 2023.

- Hande Kucuk McGinty, Kyle McKillop, Pamela Pehrsson, Jaspreet Ahuja, Melissa Nickle, Naomi Fukagawa, Peter Harrington and James Harnly , "**Encoding chemical composition of food using semantic web",** In person & Virtual, San Diego, CA, USA, ACS Spring 2022

- B.Bunin, H.McGinty, "**BioHarmony across semantic drug discovery data streams",** ACS 2020 Virtual Conference

- **H.McGinty, "OntoloBridge – A FAIR Semi-Automated Ontology Update RequestSystem",** Basel, Switzerland, ISMB/ECCB 2019

- **H.McGinty**, "**Extending Machine Learning Capabilities of BioAssay Express",** Basel, Switzerland, ISMB/ECCB 2019

- **H.McGinty, "OntoloBridge – A Semi-Automated Ontology Update RequestSystem**"; Chicago, IL; July 2018.

- **H.McGinty, "KNowledge Acquisition and Representation Methodology and ItsApplications"** International Conference on Biological Ontology (ICBO 2018)
- **H.McGinty**, Alex Clark, " **Adding value to public data using the BioAssay Express: Using semantic web axioms and machine learning to support annotation**" , Washington DC, USA, ACS 2017

- **H.Kucuk, "Library of Integrated Network-Based Cellular Signatures (LINCS) Project and Ant Colony Optimization**", XXVI EURO INFORMS Joint InternationalConference; Rome, Italy, July 3, 2013.

- **H.Kucuk, "Library of Integrated Network-Based Cellular Signatures (LINCS)Project**"; Anadolu University, Turkey, December 28, 2012.

- **H.Kucuk,** N.Millman, M.Kumar, J. Baumbach, "**Detecting Gene Specific Biological Pathways Using Expression Data with Key Pathway Miner**", Poster Presentation at thePacific Symposium on Biocomputing, HI, USA, January 3-7, 2011

- **H.Kucuk**, Benjamin J. Keller, Terry Weymouth, Barbara Mirel, "**On the User Study of Attribute Presentation Tools and Their Role in Understanding Biological Networks**",Poster Presentation at the 18th Annual International Conference on Intelligent Systems forMolecular Biology (ISMB2010), Boston, MA, USA, July 11-13, 2010

Link to List of Published Works: Google scholar citations:
https://scholar.google.com/citations?user=6N7LKgMAAAAJ&hl=en

COMPUTER AND LANGUAGE SKILLS

Programming: Java, Python, MATLAB, Prolog, Perl, C++, C#, R, JavaScript, SQL, MySQL, 8086Assembly, Verilog, C, UML.

Semantic Web Tools: Protégé, Virtuoso, Apache Fuseki.

DATABASE Tools: MySQL Workbench, pgAdmin.

Languages: English (advanced), German (intermediate), Turkish (native).

ACHIEVEMENTS AND INVOLVEMENTS

- US Semantic Technologies Symposium Series (US2TS), General Chair, 2022
- Integrated Food Ontologies Workshop Organizer (IFOW) 2020 – current
- Workshop on Ontology Patterns Organizer (WOP) 2021- current
- Teaching and Research Assistantships at University of Miami, 2011- 2017
- Grace Hopper Conference Scholar, Phoenix, AZ, USA, October 8-10, 2014
- Grace Hopper Conference, Data Science Review Committee Volunteer, 2019- current
- OBO Foundry Ontology Developer – 2018 -
- Full Research Scholarship, Multimodal Computing and Interaction, Cluster of Excellence, Saarbrücken, Germany (July 2010- 2011).
- Graduate Assistantship in Computer Science Department, Eastern Michigan University, Ypsilanti, MI, USA (Fall'07 – 2010)
- Undergraduate Research Assistantship, Department of Computer Engineering, Bilkent University, Ankara, Turkey (Summer'05 – Summer'07)
- MACUL/Special Interest Group for Computer Science 1st Annual Computer Programming for High School Students Contest Judge (November 2009)
- ACM Programming Contest'07 Participant (Competed with East-Central Region for Eastern Michigan University's Team).
- Member of ACM (since 2007)
- Member of ISCB (since 2007)
- Classical Music Subdivision Coordinator, June15, 2005 – July 1, 2007. Radio Bilkent, Ankara, Turkey.
- *Classical Music DJ*, July17, 2004 – July 1, 2007. Radio Bilkent, Ankara, Turkey