**Islam Akef Ebeid**

Assistant Professor of Computer Science at Southern Arkansas University

A person in a suit and tie

Description automatically generated with medium confidence

[Website](https://iebeid.github.io/) [Google Scholar](https://scholar.google.com/citations?user=Qwm3Py8AAAAJ&hl=en) [ResearchGate](https://www.researchgate.net/profile/Islam-Ebeid) [Web of Science](https://www.webofscience.com/wos/author/record/GLQ-8040-2022) [Old Projects](https://iebeid.github.io/tinkering.html) [Github](https://github.com/iebeid)

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# **Research Interests**

I am interested in data science and data mining in general. My primary experience and skillset are in graph mining and network science methods, natural language processing, and eye-tracking studies. But then comes the applications part. Or the “for what” question. Mainly 2 broad fields; information science and computational humanities.

The following is a list of specific applications I worked on and am interested in:

***Network Science***

**Community Detection:**

* Clustering, coloring, community & connected components detection using modularity optimization and spectral graph theory methods.

**Node Similarity:**

* Ranking, relevance, and similarity random walk-based algorithms.

**Graph Representation Learning:**

* Scalability and heterogeneity issues in graph neural networks and random walk-based graph embedding.

## ***Information Science***

**Information Extraction:**

* Entity recognition, extraction, resolution, alignment, and matching using traditional heuristic methods, graph theory, and large language models.

**Information Retrieval:**

* Search and relevance in academic and bibliographic networks, knowledge graphs, and digital libraries.

**Database & Digital Libraries:**

* Data quality, including indexing and integration, utilizing record linkage, entity resolution, and matching in relational and graph databases.

**Bibliometrics:**

* Analyzing bibliographic and citation networks using node similarity metrics.

**Health Informatics:**

* Mining biomedical digital libraries and biological networks for data-driven drug discovery.
* Understanding information behavior to improve online health information seeking using eye tracking.
* Biomedical information visualization, especially protein folding, and interaction.

## ***Computational Humanities***

**Computational Social Science:**

* Analyzing social networks and community detection.
* The applications of machine learning in non-profit and philanthropic studies.

**Human-Computer Interaction:**

* Studying and applying cognitive psychology concepts such as situation awareness and image recognition in user experience design and information-seeking using eye tracking.

**Educational Psychology:**

* Improving computer science education through visualization and computer graphics.
* Studying how to accommodate individual differences in emerging educational technologies like virtual and augmented reality.
* Empowering women and low-income populations in computer, information, and data science research and education.

# **Mission**

Data and information science as a subfield of computer science is unnecessarily male dominated. In addition, it requires spending much money on tuition and prestigious certifications to get quality education and a shot at a job. That puts women and low-income populations in positions of disadvantage. Thus, the field might be missing out on innovators and people who would help push it forward just because they are either women or low-income. Hence, I am committed to empowering women and low-income populations in computer, information, and data science research and education.

# **Education**

University of Arkansas at Little Rock, Little Rock, Arkansas (2014-2022)

MSc, Ph.D. in Computer & Information Science (GPA: 3.66)

University of Texas at Austin, Austin, Texas (2017-2020)

Graduate work at the Ph.D. program in Information Science (GPA: 3.87)

Arkansas Tech University, Russellville, Arkansas (2011-2013)

Professional MSc in Computer & Information Science (GPA: 3.92)

Ain Shams University, Cairo, Egypt (2003-2008)

BSc in Electrical & Computer Engineering

Certifications: FE, ITIL

# **Positions Held**

* Assistant Professor of Computer Science, Southern Arkansas University, Magnolia, Arkansas (2023-Current)
* Postdoctoral Research Associate, Department of Computer Science & Engineering, University of North Texas, Denton, Texas, Funded by the NIH (2022-2023)
* Research Assistant, Department of Information Science, University of Arkansas at Little Rock, Funded by the NSF (2021-2022)
* Data Science Research Intern, AbbVie Inc., Urbana-Champaign, Illinois (2020)
* Teaching Assistant, School of Information, The University of Texas at Austin (2019-2020)
* Research Assistant, School of Information, The University of Texas at Austin, Funded by Lockheed Martin Inc. & the ALA (2018-2019)
* Research Assistant, Texas Advanced Computing Center, The University of Texas at Austin, Funded by Intel Corporation (2018)
* Research Fellow, School of Information, The University of Texas at Austin (2017-2018)
* Software Engineering Intern, Intel Corporation, Santa Clara, California (2016-2017)
* Research Assistant, Emerging Analytics Center, University of Arkansas at Little Rock (2014-2017)
* Software Developer, Arkansas.gov/National Information Consortium Inc., Little Rock, Arkansas (2013-2014)
* Graduate Assistant, International, & Multicultural Student Services Office, Arkansas Tech University (2012)
* Graduate Assistant, Department of Computer & Information Science, Arkansas Tech University (2011-2013)
* Software Developer, WeDo Technologies, Cairo, Egypt (2010-2011)
* Software Developer, Orange Telecom, Cairo, Egypt (2009-2010)
* Software Developer, Xpress Integration, Cairo, Egypt (2009)
* Electronics Engineer, Hanna Instruments, Cairo, Egypt (2008)
* Software Engineering Intern, Giza Systems, Cairo, Egypt (2007-2008)
* Software Engineering Intern, Vodafone, Cairo, Egypt (2005-2006)

# **Honors & Awards**

* Outstanding Doctoral Graduate, University of Arkansas at Little Rock (2022)
* The Graduate School Professional Development Award, The University of Texas at Austin (2019)
* Best Short Paper Award, ACM SIGCHI Symposium on Eye Tracking Research (2019)
* The Graduate Recruitment Fellowship Award, The University of Texas at Austin (2017)
* Distinctive Capstone Project, Ain Shams University (2008)

# **Funding & Grants**

* Assisted with 1 NIH grant proposal during my postdoctoral training at the University of North Texas titled: Data-driven drug discovery for Alzheimer’s disease using graph representation learning, PI: Serdar Bozdag, August (2022)

# **Scholarly Work & Disseminated Research**

## ***Journal Articles (peer-reviewed)***

Ebeid, I. A. (2022). MedGraph: A semantic biomedical information retrieval framework using knowledge graph embedding for PubMed. *Frontiers in Big Data*, *5*. [Link.](https://doi.org/10.3389/fdata.2022.965619)

Ebeid, I. A., Talburt, J. R., Hagan, N. K. A., & Siddique, M. A. S. (2022). ModER: Graph-based Unsupervised Entity Resolution using Composite Modularity Optimization & Locality Sensitive Hashing. *International Journal of Advanced Computer Science & Applications*, *13*(9). [Link.](https://doi.org/10.14569/ijacsa.2022.0130901)

Yu, Q., Wang, Q., Zhang, Y. et al. Reply to issues about entity metrics & paper-entity citation network. Scientometrics 127, 2127–2129 (2022). [Link.](https://doi.org/10.1007/s11192-022-04311-y)

Ma, J., Ebeid, I. A., De Wit, A., Xu, M., Yang, Y., Bekkers, R., & Wiepking, P. (2021). Computational Social Science for Nonprofit Studies: Developing a Toolbox & Knowledge Base for the Field. *Voluntas*, *34*(1), 52–63. [Link.](https://doi.org/10.1007/s11266-021-00414-x)

Yu, Q., Wang, Q., Yang, Z., Chen, C., Ryu, H., Park, N., Baek, J., Li, K., Wu, Y., Li, D., Xu, J., Liu, M., Yang, J. J., Zhang, C., Lu, C., Zhang, P., Li, X., Chen, B., Ebeid, I. A., . . . Bu, Y. (2021). Analyzing knowledge entities about COVID-19 using entity metrics. *Scientometrics*, *126*(5), 4491–4509. [Link.](https://doi.org/10.1007/s11192-021-03933-y)

Xu, J., Kim, S., Song, M., Jeong, M., Kim, D., Kang, J., Rousseau, J. F., Li, X., Xu, W., Torvik, V. I., Bu, Y., Chen, C., Ebeid, I. A., Li, D., & Ding, Y. (2020). Building a PubMed knowledge graph. *Scientific Data*, *7*(1). [Link.](https://doi.org/10.1038/s41597-020-0543-2)

## ***Conference Papers & Presentations (peer-reviewed, mean acceptance rate: 34%)***

Ebeid, I. A., Talburt, J. R., & Siddique, M. A. S. (2022, February). Graph-based hierarchical record clustering for unsupervised entity resolution. In *ITNG 2022 19th International Conference on Information Technology-New Generations* (pp. 107-118). Cham: Springer International Publishing. [Link.](https://arxiv.org/abs/2112.06331)

Ebeid, I. A., Hassan, M., Wanyan, T., Roper, J., Seal, A., & Ding, Y. (2021). Biomedical Knowledge Graph Refinement & Completion Using Graph Representation Learning & Top-K Similarity Measure. In *the proceedings of iConference 2021* *Springer eBooks* (pp. 112–123). [Link.](https://doi.org/10.1007/978-3-030-71292-1_10)

Chen, C., Ebeid, I. A., Bu, Y., & Ding, Y. (2020). Coronavirus Knowledge Graph: A Case Study. *Workshop paper did not appear in proceedings ACM KDD 2020*. [Link.](https://arxiv.org/pdf/2007.10287.pdf)

Ebeid, I. A., Bhattacharya, N., Gwizdka, J., & Sarkar, A. (2019). Analyzing gaze transition behavior using Bayesian mixed effects Markov models. In *Proceedings of the 2019 ACM Symposium on Eye Tracking Research & Applications ETRA 2019*. [Link.](https://doi.org/10.1145/3314111.3319839)

Ebeid, I. A., & Zhang, Y. (2019). A systematic review of the literature in nature on human-computer interaction: Preliminary results. In *the proceedings of iConference 2019*. [Link.](https://doi.org/10.21900/iconf.2019.103307)

Ebeid, I. A., & Gwizdka, J. (2018). Real-time gaze transition entropy. In *Proceedings of the 2018 ACM Symposium on Eye Tracking Research & Applications ETRA 2018*. [Link.](https://doi.org/10.1145/3204493.3208340)

Ebeid, I. A., Cruz-Neira, C., Jaiswal, M., & Zybaylov, B. (2016). Protein Chemical Cross-linking/Mass Spectrometry: From raw data to fully immersive visualizations. Electronic Imaging, 28(19), 1–1. [Link.](doi:10.2352/ISSN.2470-1173.2016.19.COIMG-178)

## ***Theses & Dissertations (committee reviewed)***

Ebeid, I. A. (2022). Graph-Based Unsupervised Entity Resolution for Identifying Entity Profiles in Ambiguous Data (Doctoral dissertation, University of Arkansas at Little Rock). [Link.](https://www.proquest.com/docview/2663058689/fulltextPDF/EDE57D987E404947PQ/1?accountid=40255)

Honorary mention in the following doctoral dissertation:

Jaiswal, M. S. (2015). Analysis of protein-protein interactions using chemical cross-linking mass spectrometry (CXMS): Novel computational approaches (Doctoral dissertation, University of Arkansas at Little Rock). [Link.](https://www.proquest.com/docview/1696750056?pq-origsite=gscholar&fromopenview=true)

Ebeid, Islam A. (2013). Displaying Data Structures & Algorithms in a Graphical User Interface for Genesis Programming Language. Arkansas Tech University. [Link.](https://www.researchgate.net/publication/331972117_Displaying_Data_Structures_and_Algorithms_in_a_Graphical_User_Interface_A_Visual_Programming_and_Algorithm_Animation_Tool_for_Genesis_Programming_Language)

Ebeid, Islam Akef., et al. (2008). Vehicle Infrastructure Integration & Intersection Collision Avoidance System for Automated Traffic Systems. [Link.](https://www.researchgate.net/publication/331971949_Vehicle_Infrastructure_Integration_and_Intersection_Collision_Avoidance_System_for_Automated_Traffic_Systems%23fullTextFileContent)

## ***Books, Chapters, Op-eds, Blogs & Technical Reports (non-peer reviewed creative work)***

Ebeid, I. A. (2022, November 18). Pixels. Medium. [Link.](https://medium.com/@ebeid)

Ebeid, Islam Akef. (2021). Biomedical Multi-source Data Integration using Knowledge Graphs & Entity Resolution: Understanding author expertise in Cancer Epigenetics research. [Link.](https://www.researchgate.net/publication/357159447_Biomedical_Multi-source_Data_Integration_using_Knowledge_Graphs_and_Entity_Resolution_Understanding_author_expertise_in_Cancer_Epigenetics_research)

Ebeid, Islam Akef. (2020). Knowledge Graph Mining: A Survey of Methods, Approaches, & Applications. [Link.](https://www.researchgate.net/publication/361197281_Knowledge_Graph_Mining_A_Survey_of_Methods_Approaches_and_Applications)

Ebeid, Islam Akef. (2020). Knowledge Profiling Using Biomedical Word Embedding & Knowledge Graph. [Link.](https://www.researchgate.net/publication/340978656_Knowledge_Profiling_Using_Biomedical_Word_Embedding_and_Knowledge_Graph)

Ebeid, Islam Akef. (2019). A Literature Review On The Automatic Generation of Chest X-Ray Medical Reports using Deep Learning. [Link.](https://www.researchgate.net/publication/340978330_A_Literature_Review_On_The_Automatic_Generation_of_Chest_X-Ray_Medical_Reports_using_Deep_Learning)

Ebeid, Islam Akef. (2019). Promoting the evaluation of the credibility & the quality of online health information through online web applications. [Link.](https://www.researchgate.net/publication/338216032_Promoting_the_evaluation_of_the_credibility_and_the_quality_of_online_health_information_through_online_web_applications)

Ebeid, Islam Akef. (2018). A Comparison Between the Gaze Transition Entropy & The Bayesian Semi-parametric Mixed Effects Markov Model in Comparing Scanpaths & Gaze Transitions. [Link.](https://www.researchgate.net/publication/338215759_A_Comparison_Between_Gaze_Transition_Entropy_and_The_Bayesian_Semi-parametric_Mixed_Effects_Markov_Model_in_Comparing_Scanpaths_and_Gaze_Transitions)

Ebeid, Islam Akef. (2018). Simple Eye Tracker Calibration for Tiled Display Walls. [Link.](https://www.researchgate.net/publication/331971794_Simple_Eye_Tracker_Calibration_for_Tiled_Display_Walls)

Ebeid, I. A., Bhattacharya, N., & Gwizdka, J. (2018). Evaluating The Efficacy of Real-time Gaze Transition Entropy. Research Gate, 1(1), 1-8. [Link.](https://www.researchgate.net/publication/331971910_Evaluating_The_Efficacy_of_Real-time_Gaze_Transition_Entropy)

Ebeid, Islam Akef. (2017). Analysis of Children's Reading Performance: An Eye Tracking Experiment. [Link.](https://www.researchgate.net/publication/331971812_Analysis_of_Children's_Reading_Performance_An_Eye_Tracking_Experiment?_sg%5B0%5D=9cQqG_fe0nKfC-Y3EKXGCYPZ-ubXbUbdkc_wAyxciodWM5HOKbqI83-xt8SHqi1VUmfHHmSoEF4ZNjTa24mnRBlD5_By1pcr3xZKguWf.sl1Q_exUQ-aiJefb4SUbUANkRTbL9kOwWVoduZnt8QQGwjLA_v9Y0SHJ_91DMUzdOAWWXrFGCMtI2je1Y3OiTw)

Ebeid, Islam Akef. (2017). Intel VME Simultaneous Localization & Mapping. [Link.](https://www.researchgate.net/publication/340978409_Intel_VME_Simultaneous_Localization_and_Mapping)

Ebeid, I., & Arango, J. (2016). Mallet vs. Gensim: Topic modeling evaluation report. University of Arkansas at Little Rock. [Link.](https://www.researchgate.net/publication/331972126_Mallet_vs_GenSim_Topic_Modeling_Evaluation_Report)

Ebeid, Islam Akef. (2015). Global Big Data Management & Governance in Health Care Information Systems. [Link.](https://www.researchgate.net/publication/331972122_Global_Big_Data_Management_and_Governance_in_Health_Care_Information_Systems)

Ebeid, Islam Akef. (2015). Real-time Object Scanning & Manipulation in the CAVE. [Link.](https://www.researchgate.net/publication/331971805_Real-time_Object_Scanning_and_Manipulation_in_the_CAVE)

Ebeid, Islam Akef. (2014). The National Visualization Laboratory. [Link.](https://www.researchgate.net/publication/331972130_The_National_Visualization_Laboratory)

## ***Invited Talks, Seminars, & Media***

* **University of Arkansas at Little Rock, Donaghy College of Engineering Science & Mathematics Graduate Seminar: Knowledge Representation & Data Mining using Knowledge Graphs. (2022)**

# **Service**

## ***Peer Reviewing***

* Journal of Natural Language Engineering, Cambridge University Press (2022-2023)
* International Conference on Bioinformatics & Biomedicine (BIBM) (2022)
* 29th ACM International Conference on Information & Knowledge Management (CIKM) (2020)
* 26th ACM SIGKDD Conference on Knowledge Discovery & Data Mining, International Workshop on Knowledge Graphs (KDD) (2020)
* ACM SIGCHI Symposium on Eye Tracking Research & Applications (ETRA) (2018-2019)
* Journal of Imaging Science & Technology (2016-2018)

## ***Editing***

* Editorial Fellow, The Journal of Information & Culture, published by The University of Texas Press (2019)
* Editor for the following publication (2017)

*Emami, Yasaman, & Coskun Bayrak. “EEG analysis of evoked potentials of the brain to develop a mathematical model for classifying tinnitus datasets.” 2017 IEEE International Symposium on Medical Measurements & Applications (MeMeA). IEEE, 2017.*

## ***Conference Participation***

* Student Volunteer, ACM SIGCHI Symposium on Eye Tracking Research & Applications (ETRA) (2019)
* Representative, The International Conference for High-Performance Computing, Networking, Storage & Analysis represented the University of Arkansas at Little Rock booth (2016)
* Poster Participant, The MidSouth Computational Biology & Bioinformatics Society (2015-2016)

*Ebeid, I. A., Jaiswal, M., Cruz, C., & Zybaylov, B. (2016). VisInt-X: Visualizing Interactions in Cross-linked Proteins. ResearchGate.* [*Link.*](https://www.researchgate.net/publication/301766070_VisInt-X_Visualizing_Interactions_in_Cross-linked_Proteins)

*Ebeid, I. A., Jaiswal, M., Cruz, C., & Zybaylov, B. (2015). XLPM Map Viewer: A Protein-Protein Interaction Map Viewer. ResearchGate.* [*Link.*](https://www.researchgate.net/publication/331961223_XLPM_Map_Viewer_A_Protein-Protein_Interaction_Map_Viewer)

* Poster Participant, University of Arkansas at Little Rock Research Expo Poster “Protein-protein interaction visualization.” (2015)

## ***Committee Involvement***

* Students Member, The Diversity & Inclusion Committee, School of Information, The University of Texas at Austin (2018-2019)
* Faculty Advisor,The Computer Science Club, Southern Arkansas University (2023)

## ***Society Memberships***

* Student Member, ACM (2011)
* Professional Member, IEEE (2008)
* Professional Member, Egyptian Syndicate of Engineers (2008)

## ***Community Service***

* Volunteer, Refugee Services of Texas, Austin, Texas (2018-2020)
* Volunteer, Resala Foundation,Cairo, Egypt(2003-2008)

# **Teaching**

## ***Southern Arkansas University (mean teaching evaluation score: 4.46/5.0)***

* Instructor, CSCI 2113 Computer Science II, Programming with Python, Spring (2023)
* Instructor, MSIS 5133 Database Management Systems, Spring, Summer (2023)
* Instructor, MSIS 5033 The Unix Operating System, Summer (2023)

## ***The University of Texas at Austin (mean teaching evaluation score: 4.75/5.0)***

* Instructor, Fundamentals of Computer Vision & Machine Learning, Summer (2018), Summer (2019)
* Teaching Assistant, INF 385T Presenting Information, Spring (2019)
* Teaching Assistant, INF 380E Perspectives on Information, Spring (2019), Fall (2019), Spring (2020)
* Teaching Assistant, INF 397C Understanding Research, Spring (2019)
* Teaching Assistant, INF 385T Virtual Environments, Fall (2019), Spring (2020)
* Teaching Assistant, INF 385T Artificial Intelligence in Healthcare, Spring (2020)
* Teaching Assistant, INF 385T Data Semantics, Spring (2020)
* Teaching Assistant, INF 385T Human Interaction with Artificial Intelligence, Fall (2020)

## ***University of Arkansas at Little Rock***

* Teaching Assistant, IFSC 4345 Information Visualization, Spring (2016)
* Teaching Assistant, IFSC 5399 Programming in Python, Fall (2016)

## ***Arkansas Tech University***

* Teaching Assistant, COMS 1411 Introduction to Computer Programming, Spring (2012), Fall (2012)
* Teaching Assistant, INFT 5703 Computer Networks I, Fall (2012), Spring (2013)