Mohcine Madkour

2820 Broadmead drive, Apt# 914, Houston TX 77025 mohcine.madkour@gmail.com +1 281-652-7118

Advanced Training

School of Biomedical Informatics, UTHealth at Houston, Postdoctoral Fellow (May 2015-Present)
NIH Supported in pushing adoption of new technologies through development of proof-of-concept informatics tools for Patient Medical History Representation, Extraction, and Inference from EHR Data, and clinical big data analysis and visualization.

Engineering Technology Department, University of Houston, Postdoctoral Fellow (2013-2015)
Worked in multidisciplinary teams to build data model, analyze data, make predictions, and communicate results for smart campus environment.

Education

Ph.D., Computer Science, Honors, – 2013– University of Mohamed 5 Agdal, Rabat, Morocco
Masters of Sciences, Technologies of Web Systems – 2012 – Télécom Bretagne, Brest, France
Masters of Sciences, Statistics for Computer Science – 2008 – University of Ibn Zohr, Morocco
Bachelor of Sciences, Applied Mathematics – 2006– University of Ibn Zohr, Morocco

Research Interests

Patient Medical History Representation, Extraction, and Inference from EHR Data (NIH) PI Cui Tao
Developing tools for automatically harvesting temporal constraints of clinical events from Electronic Health Records (EHR). We use OWL Ontology for knowledge representation and providing normalization, extraction, and reasoning capabilities. Applications are multiple: StoryTelling with unstructured text data, find out missing temporal details, untangle and linearize temporal constraints of clinical events embedded in highly diverse large-scale EHR data, visual exploration of temporal events.

Predictive models for primary care patients (IRB exemption), PIs Mohcine Madkour, Ryan James, Cui Tao
Build prediction models that help taking better decisions using EHR collected in a primary care clinic. Working with real data for event analysis application that predicts specific actionable data in primary care encounters and detect hard as well as soft patterns in data. This work facilitates the and develops interactive visualizations that allow longitudinal studies of clinical events and help making clinical decisions

Modeling and Analysis of Clinical Care for HIT Improvement (AHRQ) PI Keith Butler
This project aims at bridging the gap between clinical workflows and EHR use that hinder the development of rigorous specifications to verify complex IT healthcare systems. We created an OWL based model that capture essential features and requirements of the Conceptual Work Product (CWP) and the multiple specifications required by the system's functions. We used the consistency checking of OWL reasoner engine along with model checking to better validate the IT healthcare systems

Incorporating Semantic Knowledge into Dynamic Data Processing for Energy Management System (Department of Defense) PIs Driss Benhaddou, Raymond E Cline Jr
This project aims at developing the semantic platform in which the joint adoption of Web Services and Multi Agent Systems enables the provision of easy to access, autonomic and semantic indexing, searching and deep-searching functionalities. Among the applications, real-time access and aggregate information about building environmental characteristics and energy consumption and enable the optimization of energy management and control, as well as the user's awareness about energy saving in campus.

Research Projects

- Development of a model for Semantic Representation of Clinical Trial Eligibility Criteria for Large Scale Patient Screening using SPARQL Inferencing Notation (SPIN).
- Visual exploration of clinical temporal events using cognitive engineering and network analytics
- Development of temporal extraction model based on min-conflicts and K-means algorithms that find out missing temporal events information and group events in predefined time-bins.
- Development of Temporal Event Ontology (TEO), designed for temporal information annotation in clinical narratives evaluated on EHR and VAERS Reports data.

- Design and development a timeline and visual analytics tool based on OWL API and SMILE Exhibit framework for patients' records visualization and clinical events ordering and clustering.
- Development of a SPARQL Inferencing Notation (SPIN) based model of the conceptual work product for model checking of complex systems. Example on of Patient Centered Case Management System.
- Presentation of a proposition to SysML Object Management Group for the extension of the specification "Semantics of a Foundational Subset for Executable UML Models".
- Design of Context Aware Living Campus Ontology (CALC) to model the operational and physical processes of University of Houston Smart Campus with application on energy profiling.
- Development of a context-aware middleware that support uncertain information and handle user preferences for pervasive and multi-context servicing environments (Thesis dissertation).
- Evaluation of software reliability and design of reliability prediction models (Master Thesis)
- Implementation of morphological operators for image patterns discovering and classification (Senior Project).

Teaching experience

- Teaching Assistant, UTHealth, Spring 2017, BMI 6306 Knowledge Representation in Biomedical Informatics
- Teaching Assistant, UTHealth, Spring 2016, HI 5304 Advanced Database Concepts for Health Informatics,
- Lecturer, University of Houston, Spring 2015, ELET 2300 Introduction to C++ Programming
- Adjunct professor, Civil Aviation Engineering School, Casablanca, Fall 2013, Java Programming
- Adjunct professor, Civil Aviation Engineering School, Casablanca, Spring 2012, Unified Modeling Language
- Teaching Assistant, Faculty of Sciences, Rabat, 2008-2012, Data analytics, data visualization
- Teaching Assistant, Faculty of Sciences, Agadir, 2006-2008, Matlab and Simulink, C Programming

Awards, Services

- TPC of The 2017 International Conference on Cloud Technology and Communication Engineering
- PC of the 3th IEEE International Conference on Computer Systems and Applications, AICCSA 2016.
- Best paper Award at the10th IEEE AICCSA'13 - Track : Cloud and Distributed computing
- U.S. Permanent Resident

Investigation, Grant Writing

- IRB exemption: Predictive and visual analysis of Primary Care patient information, other PIs, Dr Cui Tao, MD. James Ryan, 2016
- Qatar-QNRF_2013: Smart Campus Energy Management System: a User Preference-Behavioral Approach NPRP No.: 7-1723-2-644. Nov 2013
- NSF_CPS: Synergy-2013: Smart Management of Interconnected Federated Microgrids: Big data approach. Aug 2014

Web development Skills

- Data Science: Statistical modeling, predictive analytics, machine learning, data visualization (R, D3, Tableau)
- Data acquisition (web scraping/APIs), Graph databases, Neo4J
- Web development: Python Pelican, Jekyll, Angular JS

Example Publications

Book Contribution

[B01] **M. Madkour,** M. Bakhouya, A. Maach, D. El Ghanami "An Approach for Context-Aware Service Selection Using QoS and User Preferences" In Maristella Matera, Gustavo Rossi "Trends in Mobile Web Information Systems" pp 110-119, Springer International Publishing.

Refereed Journal Papers

[J01] **M. Madkour,** D. Benhaddou, C. Tao "Temporal data representation, normalization, extraction, and reasoning: A review from clinical domain" Computer methods and programs in biomedicine Volume 128, May 2016, Pages 52–68

[J02] **M Madkour,** D. El Ghanami, A. MAACH "QoS-Based Approach For Context- Aware Service Selection With Fuzzy Preferences Handling" International Journal of Computer Applications in Technology, Vol. 47, No 4 /2013, pp. 379-391

[J03] **M. Madkour,** A Maach, D. El Ghanami, A. HASBI "Context- Aware Service Adaptation: An Approach Based on Fuzzy Sets and Service Composition" Journal of Information Science and Engineering Vol. 29, No.1, ISSN: 1016-2364, pp. 1-16

[J04] **M. Madkour,** A Maach, D.El Ghanami, "Context-Aware Middleware For Services Retrieval And Adaptation" International Review on Computers and Software Vol. 7 N. 1 Print ISSN 1828-6003 Cd- om ISSN: 1828-6011

[J05] **M. Madkour,** A. Maach, D. El Ghanami, "An Ontology-Based Context Modeling For Vehicle Context-Aware Service" Journal of Theoretical and Applied Information Technology Vol. 34 No2 E-ISSN 1817-3195 ISSN 1992-8645

[J06] **M. Madkour**, D El Ghanami, A Maach "QoS-Based Approach For Context-Aware Service Selection" International Journal of Computational Linguistics Research, Volume: 3, Issue: 3 pp: 109-124

[J07] M. Madkour, A. Maach, "Intelligent Pervasive Middleware for Context-Aware Vehicle Services" Journal of Communications and computer Engineering VOL 2, NO 3 ISSN: 2090-6234

Referred papers at Conferences

[C01] **M. Madkour,** J. Du, H. Song, C. Tao "A Representational Analysis of A Temporal Indeterminacy Display in Clinical Events" at The 1st International Workshop on Semantics-Powered Data Analytics (SEPDA 2016) in conjunction with the IEEE International Conference on Bioinformatics and Biomedicine (BIBM 2016) to be held at Shenzhen, China on December 15, 2016

[C02] **M. Madkour**, J. Du, H.Song, C. Tao "Temporal clinical events clustering and visualization", Proceedings of the IEEE VIS 2016 Workshop on Temporal & Sequential Event Analysis. Available online at: http://eventevent.github.io

[C03] **M Madkour,** D. Benhaddou, R. Cline, M. Buriello, N.Khalil "Living campus: Towards a Context-Aware Energy Efficient Campus using Weighted Case Based Reasoning" The 29th Artificial Intelligence Conference, January 25–30, 2015, Austin Texas, USA, (AAAI-15)

[C04] **M Madkour,** A Maach, D. El Ghanami "Policy driven adaptation of context-aware services with preferences supporting" in proceeding of the10th IEEE International Conference On Computer Systems And Applications(AICCSSA'13)

[C05] **M. Madkour**, A. Maach, D. El Ghanami, A. Hasbi "Context- Aware Service Retrieval In Uncertain Context" in Proceeding of IEEE International Conference on Multimedia Computing and Systems (ICMCS'12)

[C06] **M.Madkour,** A. Maach, D. El Ghanami, A.Hasbi "Fuzzy-Based Approach For Context-Aware Service Retrieval " in proceedings of IEEE Second international conference on Innovative Computing Technology (INTECH'12)

[C07] **M. Madkour,** A. Maach, D. El Ghanami, "Vehicle Context Aware Framework For Services Provisioning And Adapting" in proceeding of International Workshop on Information Technologies and Communication (Wotic'11)

[C08] **M. Madkour**, A. Maach, "Plateforme de localisation et de télédiagnostic des véhicules" in proceedings of Logistiqua'10

Referee and Reviewer:

- American Medical Informatics Association 2015-2016
- International Conference on Intelligent Biology and Medicine (ICIBM 2016)
- Journal of Biomedical Informatics 2016
- BMC Medical Informatics and Decision Making 2016
- Journal of Biomedical Semantics 2016
- Computer Methods and Programs in Biomedicine 2015