


Stanford



Martin O'Connor

Software Dvlpr 3, Computational Medicine

 NIH Biosketch available Online

SUPERVISORS

- Mark Musen

Bio

BIO

I am a senior software engineer specializing in semantic technologies for biomedical data. With over three decades of experience in software engineering—including more than 20 years at Stanford—my work focuses on developing scalable, standards-based infrastructure for scientific metadata, ontologies, and data integration. I currently lead the engineering of the CEDAR Workbench, a system widely adopted across NIH initiatives for generating FAIR-compliant metadata.

My research portfolio spans clinical decision support, biosurveillance, and semantic data management. I developed the Chronus II and SQWRL query languages, implemented SWRL functionality in Protégé, and led the architecture of the BioSTORM outbreak detection platform. My work on metadata management has been incorporated into several NIH-funded platforms, including HuBMAP and RADx.

My recent work focuses on creating infrastructure for lifecycle management of value sets—curated collections of standardized terms critical for metadata consistency and interoperability. This effort addresses a major shortcoming in biomedical data ecosystems by enabling collaborative authoring, version control, and reuse of semantic vocabularies across research domains.

CURRENT ROLE AT STANFORD

Research software developer at Stanford Center for Biomedical Informatics Research (BMIR)

EDUCATION AND CERTIFICATIONS

- M.Sc., University of Dublin, Trinity College , Computer Science (1993)
- B.A., University of Dublin, Trinity College , Computer Science (1989)

Publications

PUBLICATIONS

- **Knowledge Engineering for Open Science: Building and Deploying Knowledge Bases for Metadata Standards** *AI MAGAZINE*
Musen, M. A., O'Connor, M. J., Hardi, J., Martinez-Romero, M.
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- **A Cloud-Based Platform for Harmonized COVID-19 Data: Design and Implementation of the Rapid Acceleration of Diagnostics (RADx) Data Hub.** *JMIR public health and surveillance*

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 - **Modeling community standards for metadata as templates makes data FAIR.** *Scientific data*
Musen, M. A., O'Connor, M. J., Schultes, E., Martínez-Romero, M., Hardi, J., Graybeal, J.
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2019; 2019: 681–90
 - **The CAIRR Pipeline for Submitting Standards-Compliant B and T Cell Receptor Repertoire Sequencing Studies to the National Center for Biotechnology Information Repositories.** *Frontiers in immunology*
Bukhari, S. A., O'Connor, M. J., Martínez-Romero, M., Egyedi, A. L., Willrett, D., Graybeal, J., Musen, M. A., Rubelt, F., Cheung, K. H., Kleinstein, S. H.
2018; 9: 1877
 - **The CAIRR Pipeline for Submitting Standards-Compliant B and T Cell Receptor Repertoire Sequencing Studies to the National Center for Biotechnology Information Repositories** *FRONTIERS IN IMMUNOLOGY*
Bukhari, S., O'Connor, M. J., Martínez-Romero, M., Egyedi, A. L., Willrett, D., Graybeal, J., Musen, M. A., Rubelt, F., Cheung, K., Kleinstein, S. H.
2018; 9
 - **CEDAR OnDemand: a browser extension to generate ontology-based scientific metadata** *BMC BIOINFORMATICS*
Bukhari, S., Martínez-Romero, M., Connor, M., Egyedi, A. L., Willrett, D., Graybeal, J., Musen, M. A., Cheung, K., Kleinstein, S. H.
2018; 19: 268
 - **The CEDAR Workbench: An Ontology-Assisted Environment for Authoring Metadata that Describe Scientific Experiments.** *The semantic Web--ISWC ... : ... International Semantic Web Conference ... proceedings. International Semantic Web Conference*
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 - **NCBO Ontology Recommender 2.0: an enhanced approach for biomedical ontology recommendation.** *Journal of biomedical semantics*
Martínez-Romero, M., Jonquet, C., O'Connor, M. J., Graybeal, J., Pazos, A., Musen, M. A.
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 - **Fast and Accurate Metadata Authoring Using Ontology-Based Recommendations.** *AMIA ... Annual Symposium proceedings. AMIA Symposium*
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 - **An Open Repository Model for Acquiring Knowledge About Scientific Experiments**
O'Connor, M. J., Martínez-Romero, M., Egyedi, A. L., Willrett, D., Graybeal, J., Musen, M. A.
edited by Blomqvist, E., Ciancarini, P., Poggi, F., Vitali, F.
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 - **The center for expanded data annotation and retrieval.** *Journal of the American Medical Informatics Association*

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- **Clustering rule bases using ontology-based similarity measures** *JOURNAL OF WEB SEMANTICS*
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 - **A semantic-based method for extracting concept definitions from scientific publications: evaluation in the autism phenotype domain** *JOURNAL OF BIOMEDICAL SEMANTICS*
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Gravier, C., Fayolle, J., Lardon, J., O'Connor, M. J.
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 - **Evaluation of semantic-based information retrieval methods in the autism phenotype domain.** *AMIA ... Annual Symposium proceedings. AMIA Symposium*
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2011; 2011: 569-77
 - **A Framework for the Automatic Extraction of Rules from Online Text**
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edited by Bassiliades, N., Governatori, G., Paschke, A.
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 - **A Method for Representing and Querying Temporal Information in OWL**
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- **TrialWiz: an ontology-driven tool for authoring clinical trial protocols.** *AMIA ... Annual Symposium proceedings. AMIA Symposium*
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- **Using an integrated ontology and information model for querying and reasoning about phenotypes: The case of autism.** *AMIA ... Annual Symposium proceedings. AMIA Symposium*
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- **An ontological approach to representing and reasoning with temporal constraints in clinical trial protocols**
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Raj, R., O'Connor, M. J., Das, A. K.
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O'Connor, M., Tu, S., Nyulas, C., Das, A., Musen, M.
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- **Knowledge-Level Querying of Temporal Patterns in Clinical Research Systems** *12th World Congress on Health (Medical) Informatics*
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- **Ontology-driven mapping of temporal data in biomedical databases.** *AMIA ... Annual Symposium proceedings / AMIA Symposium. AMIA Symposium*
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- **Ontology-driven mapping of temporal data in biomedical databases.** *AMIA ... Annual Symposium proceedings. AMIA Symposium*
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Chauhan, V. P., O'Connor, M. J., Das, A. K.
2006: 880
- **Computational method for temporal pattern discovery in biomedical genomic databases** *IEEE Computational Systems Bioinformatics Conference*
Rafiq, M. I., O'Connor, M. J., Das, A. K.
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- **Translating research into practice: Organizational issues in implementing automated decision support for hypertension in three medical centers** *JOURNAL OF THE AMERICAN MEDICAL INFORMATICS ASSOCIATION*
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