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Engineering & Scientific Consulting

Michael Simon, Ph.D.

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Professional Profile

Dr. Simon is a data scientist who specializes in the use of complex and heterogeneous datasets to solve challenges in effective healthcare delivery. He has nine years' experience in the healthcare space, with extensive experience working with electronic medical record (EMR) data, payer claims and eligibility data, practice management data, patient experience and socioeconomic data, and other public and private sources of data.

Dr. Simon has developed, prototyped, implemented, and maintained healthcare-related systems focused on data quality, risk adjustment, physician assignment, care management decision support, and text classification for performance monitoring and incentive determination. In addition, Dr. Simon has overseen the development of machine-learning based predictive tools performing a range of inferential functions from utilization likelihood to patient benefit optimization. Dr. Simon has also overseen the development of life sciences-focused data for research and has written and presented on the importance of implicit bias mitigation in predictive analytics.

Academic Credentials & Professional Honors

Ph.D., Biology, Tufts University, 2010

B.A., Economics, Rice University, 1999

B.S., Electrical and Computer Engineering, Rice University, 1999

AAAS Science and Technology Policy Fellow, National Science Foundation, 2011-2013

NSF Director's Award for Superior Accomplishment, National Science Foundation, 2012

Prior Experience

Director of Data Science, Arcadia.io*, 2019-2022

Principal Data Scientist, Arcadia.io*, 2013-2019

AAAS Science and Technology Policy Fellow, National Science Foundation, 2011-2013

Consultant, Arcadia.io*, 2011

Research Assistant, Tufts University, 2004-2010

Design Engineer, National Instruments, 1999-2002

* Formerly, "Arcadia Healthcare Solutions"

Professional Affiliations

International Society for Pharmaceutical Engineering (ISPE)

International Society for Pharmacoeconomics and Outcomes Research (ISPOR)

Patents

US Patent 10,832,819: Systems and methods for electronic health records, Nov 2020 (Simon MA, Stepro NCW)

Publications

Simon, M.A., Luginbuhl, R.D., and Parker, R. (2021) "Reduced Incidence of Long-COVID Symptoms Related to Administration of COVID-19 Vaccines Both Before COVID-19 Diagnosis and Up to 12 Weeks After." [Pre-Print]. *medRxiv*. 2021.11.17.21263608

Simon, M.A. (2010) "Tension-based crawling in *Manduca sexta*: Contributions by motor coordination, proprioception, and gross tissue movements." Doctoral dissertation. Tufts University.

Simon, M.A., Woods, W.A., Serebrenik, Y.V., Simon, S.M., van Griethuijsen, L.I., Socha, J.J., Lee, W.K., and Trimmer, B.A. (2010) "Visceral-locomotory pistoning in crawling caterpillars." *Curr. Biol.* 20: 1458-1463.

Simon, M.A., Fusillo, S.J., Coleman, K., and Trimmer, B.A. (2010) "Motor patterns associated with crawling in a soft-bodied arthropod." *J. Exp. Biol.* 213: 2303-2309.

Simon, M.A. and Trimmer, B.A. (2009) "Movement encoding by a stretch receptor in the soft-bodied caterpillar, *Manduca sexta*." *J. Exp. Biol.* 212: 1021-1031.

Project Experience

Implemented a Data Quality Initiative covering thousands of distinct data feeds from disparate electronic medical record systems, healthcare claims and enrollment data, and practice management systems, with the intent of comprehensive and continuous monitoring for "Fitness-For-Use" based business rule compliance.

Designed, implemented, and maintained enterprise-wide unstructured text ingestion and classification mechanism. In addition to using standard NLP and ML-based tools to classify expressions based on over a decade of curated data, this system managed the identification of novel expressions from data feeds, tracking of automatic and manual updates, and communication with a broad range of internal tools and processes to ensure constant and consistent updates.

Organized and managed a collaborative involving multiple data and healthcare provider organizations to develop a behavioral health decision analytics tool. This tool, based on a series of ML-developed models to optimize patient outcomes, was designed based on a cooperative development process with aligned teams of data scientists, care management leaders, and subject matter expert clinicians. The project completed with a minimum of overhead and to considerable satisfaction for all parties.

Designed, prototyped, and oversaw technical implementation of a life sciences dataset based on an enterprise-wide dataset comprising over 100M distinct records. This high priority and high-visibility project was the culmination of years of research and curation into the dataset's capabilities. The proofs of concept and data models developed during this process served as both a foundation and catalyst for the successful stand-up of a competitive and compelling data offering in the life sciences market.

Additional Education & Training

Peer-Mediation and Conflict Resolution, MIT, 2005