Michael Travers

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Summary of Qualifications

- Focus on human intelligence enhancement through AI integration and creative design
- Broad experience in scientific and medical applications
- Experienced in technical leadership and management roles

Professional Experience

Hyperphor, *Independent Consultant* 1988 - present

Offering consulting services in scientific software development, knowledge management, AI applications, visualization, and human-computer interaction for a variety of clients, including Parker Institute, Collaborative Drug Discovery, Apple, Science Commons, and IS Robotics. Example of work: a data portal for PICI-sponsored multiomic brain tumor project.

Ganymede Bio, *Software Engineer* Apr 2023 - Dec 2023

Working on platform for lab instrumentation control and data capture. Rearchitected object model and data architecture for reliability, developed internal tooling to visualize collection of workflows and resources. Tools include: TypeScript, React, GCP, Postgres, Airflow

Parker Institute for Cancer Immunotherapy, *Principal Software Engineer* Oct 2018 - Mar 2023

Led development of knowledge management tools as part of the Translational Engineering team, including RawSugar, a system for storing, integrating, regularizing and semantically tagging genomic and other experimental data supplied by our remote collaboration sites; Enflame, a visual query builder for a graph knowledge base; and Alzabo, an ontology specification language and visualization framework. Supported scientists doing analysis of clinical trial data, including statistical modelling and visualization. Tools include: Clojure, ClojureScript, R, Datomic.

Nuna Health, *Principal Software Engineer / Data Architect* Jan 2017 - Oct 2018

Led the development of several key data platform components, including tools for schema management and data quality monitoring. The overall business objective of these tools was to reduce complexity and increase throughput of the healthcare analytics data pipeline. Time to onboard a new client was reduced by approximately 30%. Worked with the Data Operations and Data Science teams to automate and streamline their work. Contributed to architecture of next-generation platform (APIs, reusable components,

microservices, high-level pipeline definition language). Led the data quality subteam Tools include: Spark, Scala, Java, Python, Airflow, d3, Looker

Vital Labs, *Principal Software Engineer / Director of Engineering* Oct 2015 - Dec 2016

Led the technical development of Orchestra, a platform for management of chronic disease and personal medical experimentation. The platform included a mobile app for patients, a web-based portal for physicians and administrators, and a data analysis pipeline. Worked with clinicians and designers to continually improve the platform. Developed a workflow formalism and engine for representing medical treatment patterns. Managed operations and deployment, security, regulatory compliance (HIPAA, FDA, engineering process capture). Tools include: Clojure, ClojureScript, Datomic, React, BigQuery, HazelCast

Quixey, *Principal Software Engineer / Team Lead, Knowledge Engineering Group* July 2013 - Sep 2015

Team lead for semantic ingestion pipeline for a large search engine. Developed ontology management tools, modules for named entity extraction, normalization, and search ranking. Lead on graph knowledge base project. Designed and prototyped a variety of research systems to illustrate semantic search concepts. Contributed to the development of query understanding and ranking algorithms. Tools include: Java, Hadoop, Pig, Spark, Luigi, RDF, graph databases, a variety of natural language libraries and resources.

Collaborative Drug Discovery, *Principal Software Engineer* July 2012 - June 2013

Worked on small team developing a complex Rails application to support cloud-based pharmaceutical drug development research. Led development of the companies first external API, created client software for integrating the CDD product into scientific workflows. Worked closely with product management to design new features. Contributed to grant writing and business development efforts. Researched and prototyped new user interface concepts. Participated in research efforts leading to scientific publications. Tools include: Rails, Knime, Common Lisp

SRI International, *Computer Scientist, Bioinformatics Research Group* 2010 - 2012

Research and developer for the BioCyc genomic database. Developed graph algorithms and an exploratory user interface for synthetic biology reaction pathfinding. Led the design and development of SmartTables, a web-based semantic spreadsheet for bioinformatics. Rebuilt the web platform underlying BioCyc to meet modern security standards and enable more dynamic user interfaces. Did outreach with the user community to define and refine new features. Tools include: Common Lisp, d3, JavaScript

CollabRx/CommerceNet, *Director, Research and Development* 2007 - 2010

Lead architect, designer, and product manager for the CollabRx platform, which provides knowledge-based collaborative computing infrastructure for distributed medical research and personalized genomic medicine. Conducted research into knowledge and workflow representation for biomedicine; designed and built prototypes for web-based software platform to support collaboration decision-making. Designed and developed a tool to support doctor-patient communication. Tools include: Common Lisp, R, Rails, Django, graph databases

IO Informatics, *Principle Software Engineer, Knowledge Systems* 2006 - 2007

Designed and developed tools for integrating and visualizing biological data for metabolomics, proteomics, and related domains, using semantic web technology. Took lead role in architecture, ontology, and product and user interface design of the company's flagship product. Tools include: C#, RDF

Afferent/MDL/Elsevier, *Director, User Interface* 1999 - 2006

Developed applications for pharmaceutical drug discovery (combinatorial chemistry, LIMS, data integration). Responsible for user interface design, architecture, and implementation. Other responsibilities included designing and implementing an object-relational mapping facility, and redesigning architecture for operation in a worldwide enterprise environment. After successful acquisition of Afferent, continued at MDL and later Elsevier as Principal Software Engineer and Architect. Developed platform for other drug discovery applications including logistics, LIMS, experiment planning. Lead engineer/architect for the client-side platform and data integration strategy. Designed end-user customization framework. Developed ontology and protocols to unify cheminformatics data across applications.

IBM Research, *Research Scientist* 1997 - 1999

Worked with the Java Tools research group designing advanced interactive programming and visualization tools; explored agent-based component architectures. Worked on XML-related application tools and contributed to schema and query standards efforts. Developed web-based knowledge management tools for corporate intranet.

Technical

Experienced in design and implementation at all levels from operating system internals to user interfaces. Languages: Java, TypeScript/JavaScript, Clojure, ClojureScript, Python, R, Ruby/Rails, Common Lisp, React, C#. Databases: MySQL, Postgres, Oracle, Elastic Search, Cassandra, Datomic, BigQuery. Deployment/Cloud: EC2, Google Cloud, AWS, Heroku, Docker. Visualization: d3.js, vega, Tableau. Big Data: Hadoop, Pig, Spark. LLMs: OpenAI, Anthropic, LangChain, DSPy.

Selected Publications

Multi-omic landscape of human gliomas from diagnosis to treatment and recurrence, *bioRxiv* 2025 (et al)

Introduction to *Inventive Minds: Marvin Minsky on Education*, ed Cynthia Solomon and Xiao Xiao, 2019

Groups: Knowledge Spreadsheets for Symbolic Biocomputing, *Database* 2013 (w. Suzanne Paley *et al*)

Accurate Atom-Mapping Computation for Biochemical Reactions, *Journal of Chemical Information and Modeling* 2012 (w. Mario Latendresse *et al*)

BioBIKE: A Web-based, programmable, integrated biological knowledge base . *Nucleic Acids Research*, 2009 (with J. Elhai, A. Taton, J.P. Massar, J.K. Myers, J. Casey, M. Slupesky, and J. Shrager).

A Visual Representation for Knowledge Structures. In *Proceedings of Hypertext '89*, 1989.

Animal Construction Kits. In *Artificial Life: SFI Series in the Sciences of Complexity*, ed. C. Langton. Addison-Wesley, 1988.

Full list of publications

Education

MIT Media Laboratory, Ph.D. in Media Arts and Sciences

> Research in programming environments, languages, and agent-based systems. Co-founded Narrative Intelligence Group. Dissertation title: Programming with Agents: New metaphors for thinking about computation. Nominated for ACM Doctoral Dissertation Award. (1996)

MIT Media Laboratory, S.M. in Visual Studies

> Research in programming environments, behavior simulation, and artificial life. Thesis title: Agar: An Animal Construction Kit, 1988

Massachusetts Institute of Technology, S.B. in Mathematics, 1986

Miscellaneous

Coding in Place, Stanford, volunteer section leader, 2020

BACE Timebank, technical advisor, 2010-2013

Behave!, visual programming system for the Virtual Fishtank exhibit, The Computer Museum, Boston, 1998.