

# Michael Bobak

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**Computational problem solver** with decades of Research-Programming/Knowledge-Engineering, AI/Knowledge-Based Modeling & Simulation aids for process improvement to teaching, around physical science research at first then to a much broader set of problems where I brought years of AI study to bear.

## Experience

2023 - PRESENT

**Ontology Data Developer/Analyst (Integrations)** [xendat.com](#) for [vrtx.com](#)

Focusing on automation to scale ontology construction. Use of python and semantic tools.

2018-2025

**Sr AI Research Engineer** [alohahealth.net](#)

- Part of a startup built on the topic of my UCSF research. Semantic search for clinical trials. [graph store/s]

2019 - 2023

**Sr Research Software Engineer** [jsda.ncsa.uiuc.edu/~mbobak](#)

- All the PoCs for [earthcube.org/geocodes](#) incl. organizing others to bring in a great NSF review
- Focus on semantics/metadata search, with some NLP and sim. [Python/SPARQL...]

2018 - 2019

**Sr Engineer, Natural Systems** [nutrienagsolutions.com/agrible](#) prepared them for the acquisition

- Ag-informatics/sim/... Planned and guided reworking the main simulation, documentation and ML/verification [Python]

2011 - 2018 **CONSULTANT, FREELANCE: ALLOTROP.ORG IDEO.COM SIEMENS.COM ...**

- Ontologist, aligning bio/pharma ontologies to BFO to annotate masses of data in HDF5 files, osthus.com work for [allotrope.org](#)
- Worked with IDEO on their systems integration / information refinement and cleanup
- Worked with the Siemens Web of Things research group on use of Semantic-Web+IoT for adaptable manufacturing
- Advised start-ups in AI: fashion blog to trends, sport dbpedia.org info, work chatbot
- Developed ideas to take my UCSF research to Patient Data Mining Cluster, via patent application
- Looked at UCSF in Psychology Department's PRIME mental health app could benefit from NLP insights
  - Coursera: Data Analysis, Data Science (with distinction), Machine Learning (with distinction), Discrete Optimization (audit)
  - openHPI: Semantic Web, Knowledge Engineering, Knowledge-Engineering w/Semantic Web technology, Linked-Data-Engineering
  - Stanford: Design Thinking

2010 - 2011 **ARCHITECT, [ADAPTIVE LEARNING PLATFORM APOLLOGRP.EDU](#)**

- Conceptually annotated study material and tests for automated remediation, instrumented classroom to learn from use [Hadoop]

2007 - 2010 **PROGRAMMER/ANALYST III [UCSF.EDU](#)**

- Medical-Informatics [research](#) (relating to clinical-trials) in Lisp/KM, and Natural-Language-Processing in Java/etc.;
- [paper](#) with Stanford [group](#); [ontology](#) dev/use [Lisp, KM, ..]

2001 - 2007 **CONSULTANT, FREELANCE: MINDBOX.COM, VERIZON.COM, LBL.GOV, GHX.COM, CME.COM**

- [mindbox.com](#) 3/02-10/02. [used Art\*Enterprise] See: [Ocwen Mindbox](#)
- Worked up to half-time for [cas.dis.anl.gov](#) 5/03-5/04 [Java Simulation]
- Worked full-time 8/03--05([Verizon](#))[labs.gte.com](#), Model-Based-Diagnosis on a national scale. [Art \*Enterprise] See: [IAA196-287.pdf](#)
- Bioinformatics/control [contract](#) 11/04-12/05 [CLIPS&Protege.stanford.edu/Java/DB] Control of perfusion pumps on light microscope sample, monitoring incl. Machine-vision, Bio-ontology/reasoning/Kn-mngt for the experiment setup. & Grant on proposal

- Worked for CME.com 2/06-06/06 (re)organizing trade-data validation code. [CLIPS/Jess]
- Signal-Processing/Machine-Learning (startup) 06/06-[Lisp/etc.]
- Hospital Informatics/Machine-Learning ghx.com 02/07-05/07-[Lisp]
- Machine-Learning speedup for financial-scientific [Lisp]

### 1998 - 2001 **RESEARCH-PROGRAMMER** [KBS.AI.UIUC.EDU](http://KBS.AI.UIUC.EDU)

- Organized many levels of a very large knowledge-based simulation projects.
- Brought over 18 programmers together to deliver a coherent product.
- Ran weekly (sub)group meetings, overall direction to help solving any problem.
- Hiring, demo, design, install trips, prototyping to lead project direction.
- Taught group of 6 how to use a Rule-Based-shell for a reasoner-rewrite in Art\*Enterprise.
- Projects included: Simulation-based, Intelligent Tutoring System (ITS) & Real-Time control system.
- Being used in classroom, real life testing, presented at IAAI99 'Automated Instructor Assistant for Ship Damage Control' The system teaches Navy officers how to save a simulated ship in crisis.
- A variant was developed to catch real-time crisis conditions and suggest solutions [www.dwilkins.org/members.htm](http://www.dwilkins.org/members.htm)

### 1996 - 1998 **KNOWLEDGE-ENGINEER** [BRIGHTWARE.COM](http://BRIGHTWARE.COM)

- Helped develop and install their very [first product \(Intelligent email reply\)](#). Worked between development and consulting. Worked on several deployed Knowledge-Based business applications (i.e. financial: mortgage, web-based job finder).
- [Art\*Enterprise]See: [http://www.brightware.com/eservice\\_solutions/](http://www.brightware.com/eservice_solutions/)
- More recently I worked ½ year for the new version of the company: [Mindbox](#).

### 1996 **LEAD PROGRAMMER/ANALYST** [INSTITUTE FOR LEARNING SCIENCES](http://INSTITUTE.FOR.LEARNING.SCIENCES)

- Wrote Lisp code (mainly GUI) for the Qualitative Research Group. Learned more about Qualitative/Quantitative Simulation, Model-Based Reasoning, Intelligent-Tutoring-Systems, & general Lisp programming.
- See: <http://www.qrg.northwestern.edu/projects/NSF/Cyclepad/aboutcp.htm>

### 1993 - 1996 **SOFTWARE-ENGINEER** [ANL.GOV](http://ANL.GOV)

- [FAD](#) then [DIS](#) groups: Wrote fielded Expert System by myself at the end of grad-school. [in Lisp rule-shell then CLIPS]
- Wrote agent-based, data-driven, goal directed control of distributed simulation by wrapping the sim/tools in a rule shell, and allowing for mixing & matching of parts, and setup, as the need arose [ C++/Smalltalk/FORTRAN wrapped w/CLIPS & com via PVM]
- Other work as needed. Algo/Viz/Etc. Written up in a book about innovative distributed object application.
- See: [http://www.dis.anl.gov/DEEM\\_HLASim](http://www.dis.anl.gov/DEEM_HLASim) [http://www.dis.anl.gov/DEEM/DIAS\\_diaswp.pdf](http://www.dis.anl.gov/DEEM/DIAS_diaswp.pdf)
- \_More recently I worked part-time for the new subgroup of dis: [cas.dis.anl.gov](http://cas.dis.anl.gov).

### 1988 - 1989 **PROGRAMMER/CONSULTANT: SHEARSON LEHMAN HUTTON, GIST, NCSA/UIUC.EDU,**

- Between degrees, I did a work abroad in a stock brokerage in London, came back to get a C testing position, a contract with NCSA to see what to do after it's early browser & other tools, and a molecular viz job that turned into my assistantship.

## Education

OCTOBER 1993

**MS Biophysics & Computational Biology**, with focus in AI

**University of Illinois, Urbana-Champaign**

Thesis: Molecular Simulation with Expert Rules (in OPS5/Lisp/C)

MAY 1988

**B.S. Physics and B.S. Biophysics** with departmental distinction, while a published ½ time research-programmer

**University of Illinois, Urbana-Champaign**