

# 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

2019 - PRESENT

**Sr Research Software Engineer** [isda.ncsa.uiuc.edu/~mbobak](http://isda.ncsa.uiuc.edu/~mbobak)

- All the PoCs for [earthcube.org](http://earthcube.org) 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/agribile](http://nutrienagsolutions.com/agribile) prepped them for the acquisition

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

2018 - PRESENT

**Sr AI Research Engineer** [alohahealth.net](http://alohahealth.net)

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

2011 - 2018

**Consultant, freelance:** [allotrop.org](http://allotrop.org) [ideo.com](http://ideo.com) [siemens.com](http://siemens.com) ...

- Working as an otologist for [osthus.com](http://osthus.com) on aligning bio/pharma ontologies to BFO to annotate masses of data in HDF5 files, for the [allotrope.org](http://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](http://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](#)

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

2007 - 2010

**Programmer/Analyst III** [ucsf.edu](http://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](http://mindbox.com), [Verizon.com](http://Verizon.com), [lbl.gov](http://lbl.gov), [ghx.com](http://ghx.com), [cme.com](http://cme.com)

- [mindbox.com](http://mindbox.com) 3/02-10/02. [used Art\*Enterprise] See: [Ocwen\\_Mindbox](#) Worked up to half-time for [cas.dis.anl.gov](http://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: [aaai.org/Papers/IAAI/1996/IAAI96-287.pdf](http://aaai.org/Papers/IAAI/1996/IAAI96-287.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 proposal work. 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)

- Organize 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, down 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. Helped on several Knowledge-Based business applications. Helped with 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 1/2year for the new version of the company: Mindbox.

1996 AUG - FEB

### **Lead Programmer/Analyst** [Institute for Learning Sciences](#)

- Wrote Lisp code (mainly GUI) for 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>

1996 - 1998

### **Software-Engineer** [anl.gov](http://anl.gov)

- [EAD](#) then [DIS](#) groups: Wrote fielded Expert System by myself at the end of grad-school. [in Lisp rule-shell then CLIPS] Prototyped communication & control of distributed simulation. [in CLIPS PVM etc.] Agent wrapping of simulations with CLIPS+PVM, to describe then mix and match them. Also used C++/Smalltalk/FORTRAN with 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, 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 assistanceship.

## **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 half-time research programmer

#### **University of Illinois, Urbana-Champaign**