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

## 2018 - Present

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

- All the PoCs for [earthcube.org](http://earthcube.org/eco)/[geocodes](https://www.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**](https://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**](https://www.allotrope.org/)[**ideo.com**](https://www.ideo.com/)[**siemens.com**](https://ecosystem.siemens.com/researchandinnovation/bay-area/overview) **…**

- Ontologist, aligning bio/pharma ontologies to BFO to annotate masses of data in HDF5 files, osthus.com work for [allotrope.org](https://www.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](https://www.dataversity.net/semantic-web-jobs-apollo-group/) [ApolloGrp.edu](http://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**](http://ucsf.edu/)

- Medical-Informatics [research](https://web.archive.org/web/20180330162538/http%3A/rctbank.ucsf.edu/) (relating to clinical-trails) in Lisp/KM, and Natural-Language-Processing in Java/etc.;

-  [paper](https://web.archive.org/web/20100624070815/https%3A/bmir.stanford.edu/publications/view.php/a_practical_method_for_transforming_free_text_eligibility_criteria_into_computable_criteria) with Stanford [group](http://www.bioontology.org/); [ontology](https://web.archive.org/web/20180610202551/http%3A/rctbank.ucsf.edu/home/ergo) dev/use [Lisp, KM, ..]

## 2001 - 2007

**Consultant, freelance:** [**mindbox.com,**](https://web.archive.org/web/20060111180352/http%3A//www.mindbox.com/home.html)[**Verizon.com**](https://www.verizon.com/about/sites/default/files/gte/index.html)**,** [**lbl.gov**](https://www2.lbl.gov/Science-Articles/Archive/remote-microscopy.html)[**,**](https://www.researchgate.net/profile/Daniel-Callahan-2) [**ghx.com,**](https://www.ghx.com/)[**cme.com**](https://www.cmegroup.com/)

- [mindbox.com](https://web.archive.org/web/20060111180352/http%3A/www.mindbox.com/home.html) 3/02-10/02. [used Art\*Enterprise] See: [Ocwen\_Mindbox](https://web.archive.org/web/20061101213806/http%3A/www.mindbox.com/NewsEvents/PressReleases/21OCT2002.pdf)

- Worked up to half-time for [cas](http://web.archive.org/web/20041101034804/http%3A/www.dis.anl.gov/msv/msv_cas.html).dis.anl.gov 5/03-5/04 [Java Simulation]

- Worked full-time 8/03-~05([Verizon](http://liveweb.archive.org/http%3A/www22.verizon.com/technologytesting/images/sitlablocations_2010_907.jpg))[labs](http://web.archive.org/web/200102032350/http%3A/info.gte.com/).[gte](http://en.wikipedia.org/wiki/GTE).com, Model-Based-Diagnosis on a national scale. [Art \*Enterprise] See: [IAAI96-287.pdf](https://web.archive.org/web/20151023053231/http%3A//aaai.org/Papers/IAAI/1996/IAAI96-287.pdf)

- Bioinformatics/control [contract](http://escholarship.org/uc/item/9sx790dw) 11/04-12/05 [[CLIPS](https://www.clipsrules.net/)&[Protege](https://protege.stanford.edu/).] 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://web.archive.org/web/19991004063539/http%3A/www-kbs.ai.uiuc.edu/home-main.htm)

- 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](https://web.archive.org/web/20110919232109/http%3A/www.dwilkins.org/members.htm)

## 1996 - 1998

**Knowledge-Engineer** [**brightware.com**](http://web.archive.org/web/200101182329/http%3A/www.brightware.com/)

- Helped develop and install their very [first product (Intelligent email reply)](https://patents.justia.com/assignee/brightware-inc). 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://web.archive.org/web/20031203203326/http%3A/www.brightware.com/eservice_solutions/)  later ½ year for the new version of the company: [Mindbox](https://web.archive.org/web/20030204163006/http%3A//www.mindbox.com/home.html).

## 1996

**Lead Programmer/Analyst** [**Institute for Learning Sciences**](http://web.archive.org/web/20010419070659/http%3A/www.ils.nwu.edu/)

- 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](http://web.archive.org/web/20070204072524/http%3A/www.qrg.northwestern.edu/projects/NSF/Cyclepad/aboutcp.htm)

## 1993 - 1996

**Software-Engineer anl.gov**

- [EAD](http://www.evs.anl.gov/) then [DIS](https://web.archive.org/web/20080118110818/http%3A/www.dis.anl.gov/) 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](http://web.archive.org/web/20050911000443/http%3A/www.dis.anl.gov/DEEM/) [HLAsim](http://en.wikipedia.org/wiki/High-level_architecture_%28simulation%29) [http://www.dis.anl.gov/DEEM/DIAS](http://web.archive.org/web/20050219064147/http%3A/www.dis.anl.gov/DEEM/DIAS/) [diaswp.pdf](http://ideational.ddns.net/b/mikebobak/diaswp.pdf)

\_More recently I worked part-time for the new subgroup of dis: [cas.dis.anl.gov](http://web.archive.org/web/20040404121954/http%3A/www.dis.anl.gov/msv/msv_cas.html).

## 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