

# Michael Bobak

Knowledge-Engineer / Research-Programmer

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[Champaign, IL](#)

Tweets: [@MBstream](#)

## SUMMARY

[Research-Programmer](#) starting with (bio)[physical-science](#) simulation, adding AI study and years of [Knowledge-Engineering](#) work as well ([edu/gov/com](#)).

Focus on [Knowledge-Based](#) aids, for process improvement to [teaching](#). AI: [Knowledge-Representation and Reasoning](#), [Rules](#), [Kn-Acq](#), [NLP](#), [ML](#), ...

## WORK EXPERIENCE

- |          |  |
|----------|--|
| Present  | <b>National Center for Supercomputing Applications</b> <i>Urbana, IL</i>   |
| Nov 2019 | <a href="#">Sr Research Software Engineer</a>  |
|          | Bringing my background to <a href="#">earthcube.org</a> and other grants. Focus on semantics/metadata search, with some NLP and sim. [py/..]   |
| Aug 2019 | <b>Agribile/Nutrien</b> <i>Urbana, IL</i>  |
| Aug 2018 | <a href="#">Sr Engineer, Natural Systems</a>   |
|          | Ag-informatics/sim/.. Planned and guided reworking the main simulation, documentation and ML/verification [Python]   |
| Present  | <b>AlohaHealth</b> <i>remote</i>   |
| Jun 2018 | <a href="#">Sr Knowledge-Engineer</a>  |
|          | Advising early stage startup built on the topic of my ucsf research. Semantic search for clinical trials. [graph store/s]  |
| Jul 2018 | <b>Freelance</b> <i>San-Francisco, CA</i>  |
| Jul 2011 | <a href="#">consultant</a>   |
|          | <ul style="list-style-type: none"><li>- Working as an ontologist for osthus.com on aligning bio/pharma ontologies to BFO to annotate masses of data in HDF5 files, for the <a href="#">allotrope.org</a></li><li>- Worked with IDEO on their systems integration issues that could be aided by Knowledge-Graph for information refinement and cleanup</li><li>- Worked with the Siemens Web of Things research group on use of SemWeb+IoT for adaptable manufacturing</li><li>- Advised with a variety of start-ups in understanding AI tech, including:<ul style="list-style-type: none"><li>- Fashion start-up that would track unstructured blog info to surface trends</li><li>- Sports startup thewhytehousegroup.com needed dbpedia search ability</li><li>- Chatbot in work context</li></ul></li><li>- Developed ideas to take my UCSF research and fuse it with the Patient Data Mining Cluster that was developed by the UCSF Head of Research Computing and a PhD student, which has now been submitted for a patent</li><li>- Worked with UCSF in Psychology Department understand how to apply NLP and graph relation insights into an app they developed called Prime, to help with mental health management</li><li>- Continued to build skills around ML, Semantic-Web/Linked-Data, and Knowledge-Engineering, with these courses, from:<ul style="list-style-type: none"><li>- Coursera: Data Analysis, Data Science (with distinction), Machine Learning (with distinction), Discrete Optimization (audit)</li><li>- openHPI: Semantic Web, Knowledge Engineering, Kn Eng w/Semantic Web technology, LinkedDataEngineering</li><li>- Stanford: Design Thinking</li></ul></li></ul> |
| Jul 2011 | <b>ApolloGrp.edu</b> <i>San-Francisco, CA</i>  |
| Oct 2010 | Architect , <a href="#">Adaptive Learning Platform</a>   |
|          | Conceptually annotate study material & tests for automated remediation, instrument classroom to learn from use [Hadoop, Lisp, KM]  |
| Oct 2010 | <b>UCSF.edu</b> <i>San-Francisco, CA</i>   |
| Sep 2007 | <a href="#">Programmar/Analyst III</a>   |
|          | Medical-Informatics <a href="#">research</a> (relating to clinical-trails) in Lisp/KM, and Natural-Language-Processing in Java/etc; <a href="#">paper</a> with Stanford <a href="#">group</a> ; <a href="#">ontology</a> dev/use [Lisp, KM, ..]  |

Sep 2007	<b>Freelance</b> <i>Chicago/Boston</i>
Feb 2001	Knowledge-Engineer/ Research-Programmer
	<p><a href="http://mindbox.com">mindbox.com</a> 3/02-10/02. [used Art*Enterprise] See: <a href="http://Ocwen_Mindbox">Ocwen_Mindbox</a> Worked up to half-time for <a href="http://cas.dis.anl.gov">cas</a>.dis.anl.gov 5/03-5/04 [Java Simulation] Worked full-time 8/03-~05(<a href="http://verizonlabs.gte.com">verizon</a>)<a href="http://labs.gte.com">labs.gte.com</a>, Model-Based-Diagnosis on a national scale. [Art *Enterprise] See: <a href="http://aaai.org/Papers/IAAI/1996/IAAI96-287.pdf">aaai.org/Papers/IAAI/1996/IAAI96-287.pdf</a> Bioinformatics/control <a href="http://contract">contract</a> 11/04-12/05 [CLIPS&amp;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. &amp; 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], MachineLearning speedup for financial-scientific [Lisp]</p>
Feb 2001	<b>kbs.ai.UIUC.edu</b> <i>Urbana, IL</i>
Jun 1998	(Senior) Research Programmer ( <a href="http://Knowledge Based Systems Lab">Knowledge Based Systems Lab</a> )
	<p>University of Illinois Urbana-Champaign, IL 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) &amp; 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 <a href="http://www.dwilkins.org/members.htm">www.dwilkins.org/members.htm</a></p>
Jun 1998	<b>Brightware</b> <i>out of Chicago, IL</i>
Oct 1996	Knowledge-Engineer
	<p>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 (ie. financial: mortgage, web based job finder). [Art*Enterprise]See: <a href="http://www.brightware.com/eservice_solutions/">http://www.brightware.com/eservice_solutions/</a> More recently I worked 1/2year for the new version of the company: Mindbox.</p>
Aug 1996	<b>Institute of Learning Sciences</b> <i>Evanston, IL</i>
Feb 1996	Lead Programmer/Analyst
	<p>Wrote Lisp code (mainly GUI) for Qualitative Research Group. Learned more about Qualitative/Quantitative Simulation, Model-Based Reasoning, Intelligent-Tutoring-Systems, &amp; general Lisp programming. See: <a href="http://www.qrg.northwestern.edu/projects/NSF/Cyclepad/aboutcp.htm">http://www.qrg.northwestern.edu/projects/NSF/Cyclepad/aboutcp.htm</a></p>
Feb 1996	<b>Argonne National Lab</b> <i>Argonne, IL</i>
Feb 1993	Software Engineer ( <a href="http://EAD">EAD</a> then <a href="http://DIS">DIS</a> groups)
	<p>Wrote fielded Expert System by myself at the end of grad-school. [in Lisp rule-shell then CLIPS] Prototyped communication &amp; 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: <a href="http://www.dis.anl.gov/DEEM_HLAsim">http://www.dis.anl.gov/DEEM_HLAsim</a> <a href="http://www.dis.anl.gov/DEEM/DIAS_mike.bobak.googlepages.com/diaswp.pdf">http://www.dis.anl.gov/DEEM/DIAS_mike.bobak.googlepages.com/diaswp.pdf</a> _More recently I worked part-time for the new subgroup of dis: <a href="http://cas.dis.anl.gov">cas.dis.anl.gov</a>.</p>
Jan 1993	<b>UIUC.edu</b> <i>Urbana, IL</i>
Jan 1990	Graduate Research Assistant /Research Programmer
	<p>Wrote molecular graphics package used in classes &amp; for publications. [in C] Used machine-learning techniques for protein structure prediction.</p> <p>Wrote thesis on Knowledge-Based Simulation Environment. [Lisp/OPS5/C] Overseen by heads of the NCSA CompBio group and head of Biophysics at the time. see: <a href="http://web.bilkent.edu.tr/ncsa/Apps/CBdir.html">web.bilkent.edu.tr/ncsa/Apps/CBdir.html</a></p>
Dec 1989	<b>[National Center for Supercomputing Applications]NCSA,Uof IL,GIST</b> <i>Urbana/Savoy, IL</i>
Apr 1989	Programmer/Consultant
	<p>Suggested scientific software path for Software Tools Group of NCSA; Wrote molecular viz code for a professor. Wrote testing code for Global Info Systems Tech. [in C]</p>
Apr 1989	<b>Shearson Lehman Hutton</b> <i>London, England</i>
Oct 1988	Programmer (Research Computing)

Maintained financial databases & daily report information. Organized worldwide mailing system. Wrote statistics code for stock predictions. [MUMPS and Maths-package]

Aug 1988 **US Army Corp. of Eng. Research Lab** Champaign, IL  
Mar 1982 Research Programmer (Modeling then Acoustics teams)

Provided research support from start to finish. [FORTRAN] Wrote and ran computer simulation code, compared output with field data. Did field measurements to back up predictions. (Team/Self; Local/US/World-wide) My work went into several [published papers](#). GRASS: [grass.osgeo.org](http://grass.osgeo.org)

EDUCATION

**University of Illinois, Urbana-Champaign**  
MS Biophysics & Computational Biology with AI, 1990-93  
  
BS Physics, BS Biophysics, 1983-88, dept. distinction

PROFESSIONAL ORGANIZATIONS:

[AAAI \(Association for the Advancement of Artificial Intelligence\)](#) life-member.  
[IEEE \(Institute of Electrical and Electronics Engineers\)](#)& [Computer Society](#) 10yrs  
also: [meetup.com](http://meetup.com) and [linkedin-groups](#)

SKILLS & EXPERTISE

AI

Artificial Intelligence Adaptive Systems Business Rules Recommender-Systems Conceptual Modeling Data Mining

Intelligent Agents Intelligent Systems Knowledge Engineering Knowledge-based Systems Machine Learning Natural Language Processing

Natural Language Understanding Ontology Engineering Rules Semantic Web Semantics Causal Inference Case-Based\_Reasoning

Composite Applications Computational Intelligence Controlled Vocabularies Data Analysis Decision Modeling Expert Systems Information Access

Information Extraction Information Retrieval Intelligent Tutoring Systems Knowledge Representation Logic Programming Mathematical Logic

Mathematical Programming Model-based\_reasoning Ontology Development Rules Engines SNOMED Semantic Search Semantic Technologies

Taxonomy Development Text Classification

Science

Research Scientific Software Scientific Computing Scientific Visualization Simulation Computational Mathematics

Biophysics Computational Biology Physics

Others

Cloud Computing MapReduce Hadoop Dynamic Languages Exploratory\_programming Common Lisp other Languages

PROGRAMMING LANGUAGES/....:

19+ years overall	<i>Object Orientated</i> [14+ years]	<i>Rule-Based KnRep&amp; Reasoning:</i> [10+ years]:	Libs:	Databases:	Operating-Systems:
C(6+ years)	Smalltalk (~1 yr)	C++ OPS5, Prolog,	Viz: OpenGL(3+ yrs)	MS-Jet/SQL, MySQL	NeXTSTEP, MS(NT..XP) (8+ yrs)
FORTRAN(6+ yrs)	(1+yr)	GoldWorks(<1yr)	HPC: PVM (1+yr)	PostgreSQL, ORDB	UNIX (18+ years),
Scheme (~1 yr)	MUMPS (1/2yr)..	Python(5+yrs),			incl. <a href="#">GNULinux</a>
	Java/Scala (1+ yr)	CLIPS(4+yrs),ART(4+years)			OS-X.Darwin(10+ years)
Lisp (7+yrs of CL 10+yrs of others)	CLOS [CL -Object-System]	Knowledge-Machine(3+years), JESS(1 yr), Protege(6+yrs)	WS:Tomcat/Axis SOAP/REST	Graph&triple persistence &other NoSQL	
github opensource examples at <a href="https://github.com/MBcode">github.com/MBcode</a>					
as <a href="#">html/ pdf</a> and <a href="#">latest-talk</a> . . . . .					