

Michael Bobak

Knowledge-Engineer / Research-Programmer

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

Sep 2007

Feb 2001

Freelance *Chicago/Boston*

Knowledge-Engineer/ Research-Programmer

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(verizonlabs.gte.com, Model-Based-Diagnosis on a national scale. [Art *Enterprise] See: 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], MachineLearning speedup for financial-scientific [Lisp]

Feb 2001

Jun 1998

kbs.ai.UIUC.edu *Urbana, IL*

(Senior) Research Programmer (Knowledge Based Systems Lab)

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) & 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

Jun 1998

Oct 1996

Brightware *out of Chicago, IL*

Knowledge-Engineer

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: http://www.brightware.com/eservice_solutions/ More recently I worked 1/2year for the new version of the company: Mindbox.

Aug 1996

Feb 1996

Institute of Learning Sciences *Evanston, IL*

Lead Programmer/Analyst

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>

Feb 1996

Feb 1993

Argonne National Lab *Argonne, IL*

Software Engineer (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/DIAS_mike.bobak.googlepages.com/diaswp.pdf _More recently I worked part-time for the new subgroup of dis: cas.dis.anl.gov.

Jan 1993

Jan 1990

UIUC.edu *Urbana, IL*

Graduate Research Assistant /Research Programmer

Wrote molecular graphics package used in classes & for publications. [in C] Used machine-learning techniques for protein structure prediction.

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: web.bilkent.edu.tr/ncsa/Apps/CBdir.html

Dec 1989

Apr 1989

[National Center for Supercomputing Applications]NCSA,Uof IL,GIST *Urbana/Savoy, IL*

Programmer/Consultant

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]

Apr 1989

Oct 1988

Shearson Lehman Hutton *London, England*

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.fbk.eu

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 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/....:

<u>19+ years overall</u>	<u>Object Orientated</u>	<u>Rule-Based KnRep&</u>	<u>Libs:</u>	<u>Databases:</u>	<u>Operating-Systems:</u>
	<u>[14+ years]</u>	<u>Reasoning: [10+ years]:</u>			
C(6+ years)	Smalltalk (~1 yr) C++	OPS5 , Prolog ,	<u>Viz:</u> OpenGL (3+ yrs)	MS-Jet/SQL, MySQL	NeXTSTEP, MS(NT..XP) (8+ yrs)
FORTRAN(6+ yrs)	(1+yr)	GoldWorks (<1yr)		PostgreSQL, ORDB	UNIX (18+ years),
Scheme (~1 yr) MUMPS (1/2yr)..	Python(5+yrs),	CLIPS (4+yrs), ART (4+yrs)	<u>HPC:</u> PVM (1+yr)		incl. GNULinux
Lisp (7+yrs of CL 10+yrs	CLOS [CL -Object-System]	Knowledge-Machine (3+yrs), JESS (1 yr), Protege (6+yrs)	<u>WS:</u> Tomcat/Axis SOAP/REST	Graph&triple persistence	OS-X .Darwin(10+ years)
of others)				&other NoSQL	

[github](#) [opensource](#) [examples](#)

[as a pdf](#) and [latest-talk](#)