

# Michael Bobak

## Knowledge-Engineer / Research-Programmer

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- San Francisco, California
- [@MBstream](#)

## Summary

[Research-Programmer](#) starting with [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](#), ...

## Skills & Expertise

### AI

[Artificial Intelligence](#) [Adaptive Systems](#) [Business Rules](#) [Case-Based Reasoning](#) [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](#) [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](#) [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](#)

### Others

[Cloud Computing](#) [MapReduce](#) [Hadoop](#) [Dynamic Languages](#) [Exploratory programming](#) [Common Lisp](#)  
[other Languages](#)

# Work Experience

## Freelance San-Francisco, CA

### consultant

July 2011 Present

Develop startup idea/s, starting with working on a ProofOfConcept for Patient DataMiningCluster patent application that I helped start at ucsf.edu

## ApolloGrp.edu San-Francisco, CA

### Architect , Adaptive Learning Platform

Oct 2010 May 2011

Conceptually annotate study material & tests for automated remediation, instrument classroom to learn from use [Hadoop, Lisp, KM]

## UCSF.edu San-Francisco, CA

### Programmer/Analyst III

Sep 2007 Oct 2010

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, ..]

## Freelance Chicago/Boston

### Knowledge-Engineer/ Research-Programmer

Feb 2001 Sep 2007

[mindbox.com](#) 3/02-10/02. [used Art\*Enterprise] See: [Ocwen\\_Mindbox](#) Worked up to half-time for <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](#)

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]

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

### **(Senior) Research Programmer (Knowledge Based Systems Lab)**

Jun 1998 Feb 2001

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 <http://www.dwilkins.org/members.htm>

## **Brightware out of Chicago, IL**

### **Knowledge-Engineer**

Oct 1996 Jun 1998

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

## **Institute of Learning Sciences Evanston, IL**

### **Lead Programmer/Analyst**

Feb 1996 Aug 1996

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>

# **Argonne National Lab Argonne, IL**

## **Software Engineer (EAD then DIS groups)**

Feb 1993 Feb 1996

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](http://mike.bobak.googlepages.com/diaswp.pdf) \_ More recently I worked part-time for the new subgroup of dis: [cas.dis.anl.gov](http://cas.dis.anl.gov).

# **UIUC.edu Urbana, IL**

## **Graduate Research Assistant /Research Programmer**

Jan 1990 Jan 1993

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](http://web.bilkent.edu.tr/ncsa/Apps/CBdir.html)

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

## **Programmer/Consultant**

Apr 1989 Dec 1989

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]

# Shearson Lehman Hutton London, England

## Programmer (Research Computing)

Oct 1988 Apr 1989

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

# US Army Corp. of Eng. Research Lab Champaign, IL

## Research Programmer (Modeling then Acoustics teams)

Mar 1982 Aug 1988

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: <http://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](#), [linkedin-groups](#), & [github opensource examples](#)

## Programming Languages/...:

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