

## **Michael Bobak**

Knowledge-Engineer / Research-Programmer in San Francisco, California

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### **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&Reasoning, Rules, Kn-Acq, NLP, ML, et.al.

### **WORK EXPERIENCE**

#### **Freelance Consultant, San-Francisco, CA**

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, &then idea using info-retrieval associated with concept tagging and search.

#### **Apollo Group, 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]

#### **University of California, San Francisco, 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 Consultant, Chicago/Boston**

Knowledge Engineer/Research Programmer / Feb 2001 - Sep 2007

mindbox.com 3/02-10/02. [used Art\*Enterprise] See: Ocwen\_Mindbox Worked upto 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](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], MachineLearning speedup for financial-scientific [Lisp]

#### **University of Illinois Urbana-Champaign - Knowledge Based Systems Lab, Urbana, IL**

Senior Research Programmer (kbs.ai.UIUC.edu) / Jun 1998 - Feb 2001

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, 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.

### **Northwestern University - 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 and 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_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).

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

### **University of Illinois Urbana-Champaign, Champaign, 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 Corps of Engineers Research Lab, Champaign, IL**

Research Programmer (Modeling and 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](http://meetup.com), [linkedin-groups](https://www.linkedin.com/groups), & [github opensource examples](https://github.com)

## 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](#) [Physics](#)

### Others

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

## PROGRAMMING LANGUAGES [19+ yrs]

C(6+ years) FORTRAN(6+ yrs) Scheme(~1 yr) MUMPS (1/2yr) Lisp(7+yrs of CL 10+yrs of others) OOP[14+ yr]: Smalltalk(~1 yr) C++(1+ yr) Python(< 1yr) Java(1+ yr) CLOS[CL -Object-System](7+) Rule-Based Languages, KnRep&Reasoning: [10+ years]: OPS5[OfficialProductionSystem5], Prolog, GoldWorks(< 1 yr), CLIPS(4+yrs),ART-Enterprise(4+years), Knowledge-Machine(3+years), JESS(1 yr), Protege(6+yrs)

Libs: Viz: OpenGL(3+ yrs) HPC: PVM (1+yr) WS:Tomcat/Axis SOAP/REST

Databases: MS-Jet/SQL MySQL PostgreSQL ORDB NOSQL Graph&triple persistence

Operating-Systems: NeXTSTEP MS(NT..XP)(8+ yrs), UNIX(18+ years)incl.GNULinux OS-X.Darwin(10+ years)

College Course work related to Artificial Intelligence (AI): Introduction to Artificial Intelligence, Pattern Recognition & Machine Learning, Programming Language Principles, Special Topics in Neural Networks, Mathematical Modeling & Visualization, ComputerInference& KnowledgeAcquisition, Design of Computer Problem Solvers, Computer Models of Cognitive Processes, AI-2 <http://aima.cs.berkeley.edu/> , Mechanized Mathematical Inference -(1/2 of), Human Computer Interaction(HCI), Building Problem Solvers

College Extracurricular Experience: Physics Society officer, (vp/etc) 3yrs; Community Radio Station show, 2 yrs ..

Seeking creative computational problem-solving post as either a: Knowledge-Engineer, Scientific/Research-Programmer, Systems/Data/Information-Analyst/Architect, Scientist, Multi-disciplined Research/Software-Engineer. I solve problems using my varied background, I don't just program; If all you have is a spec or something to be tended, I'm not interested. I continue to further my knowledge/experience with Artificial Intelligence/Modeling&Simulation techniques; through stimulating peer interaction, challenging projects. Particular interest in a Knowledge-Based-Modeling&Simulation Environment, Assisted Problem-Solving-Environments/Big-Data-Science. Knowledge -(Representation/Reasoning/Mngt) for cooperative Scientific modeling[e-Science, Semantic(Web/Grid)Services] via multi-use Model-Based-Reasoning/descriptive(layer of logic) to use preconstructed applications&data. Prefer dynamic(event/data-driven)language/environments. Having a Lisp(like)language, use of AI techniques&a science/fun domain, would do it for me.