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 <u>Knowledge-Based</u> aids, for process improvement to <u>teaching</u>. <u>Al</u>: <u>Knowledge-Representation and Reasoning</u>, <u>Rules</u>, <u>Kn-Acq</u>, <u>NLP</u>, <u>ML</u>, ...

WORK EXPERIENCE

ent National Center for Supercomputing Applications Urbana, IL

Nov 2019 Sr Research Software Engineer

Bringing my background to <u>earthcube.org</u> and other grants as need be. Focus on semantics/metadata search, with some NLP and sim

Aug 2019 Agrible/Nutrien Urbana, IL

Aug 2018 Sr Engineer, Natural Systems

Aq-informatics/sim/.. Planned and guided reworking the main simulation, documentation and ML/verification

Present AlohaHealth Urbana, IL

Jun 2018 Sr Knowledge-Engineer

Advising early stage startup built on the topic of my ucsf research. Semantic search for clinical trials.

Jul 2018 Freelance San-Francisco, CA

Jul 2011 consultant

- 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+loT for adaptable manufacturing
- Advised with a variety of start-ups in understanding AI tech, including:
- 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, which has been designed for schizophrenic young adults, with application to depression management as well
- Continued to build skills around ML, Semantic-Web/Linked-Data, and Knowledge-Engineering:
- Coursera courses: Data Analysis, Data Science (with distinction), Machine Learning (with distinction), Discrete Optimization (audit)
- openHPI courses: Semantic Web, Knowledge Engineering, Kn Eng w/Semantic Web technology, LinkedDataEng
- Stanford courses: Design Thinking

Jul 2011 ApolloGrp.edu San-Francisco, CA

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 San-Francisco, CA

Sep 2007 Programmar/Analyst III

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Medical-Informatics <u>research</u> (relating to clinical-trails) in Lisp/KM, and Natural-Language-Processing in Java/etc; <u>paper</u> with Stanford <u>group</u>; <u>ontology</u> dev/use [Lisp, KM, ..]

Sep 2007 Freelance Chicago/Boston

Feb 2001 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(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], Machine-Learning speedup for financial-scientific [Lisp]

Feb 2001 kbs.ai.UIUC.edu Urbana, IL

lun 1998

Aua 1996

(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 **Brightware** out of Chicago, IL

Oct 1996 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.

Institute of Learning Sciences Evanston, IL

Feb 1996 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.grq.northwestern.edu/projects/NSF/Cyclepad/aboutcp.htm

Feb 1996 Argonne National Lab Argonne, IL

Feb 1993 Software Engineer (<u>EAD</u> then <u>DIS</u> 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/blasm mike.bobak.googlepages.com/diaswp.pdf _More recently I worked part-time for the new subgroup of dis: cas.dis.anl.gov.

Jan 1993 **UIUC.edu** Urbana, IL

Jan 1990 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 [National Center for Supercomputing Applications]NCSA, Uof IL, GIST Urbana/Savoy, IL

Apr 1989 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 **Shearson Lehman Hutton** London, England Oct 1988 Programmer (Research Computing)

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 <u>published papers</u>. GRASS: <u>grass.fbk.eu</u>

EDUCATION

University of Ilinois, 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

Al 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						
<u>Mathematical Programming</u> <u>Model-based_reasoning</u> <u>Ontology Development</u> <u>Rules Engines</u> <u>SNOMED</u> <u>Semantic Search</u> <u>Semantic Technologies</u>						
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/...:

as a pdf and latest-talk

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