

Dr. Nigam Shah
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San Jose, CA 95130
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EDUCATION

- 2007 Postdoctoral training, Medical Informatics
Stanford University, Stanford CA
- 2005 Ph.D. Integrative Biosciences (Molecular Medicine)
The Pennsylvania State University, University Park, PA
- 1999 M.B.B.S. (Bachelor of Medicine and Bachelor of Surgery)
Baroda Medical College, M.S. University Baroda, India

WORK EXPERIENCE

- Current Research Scientist, Stanford Medical Informatics
and the National Center for BioMedical Ontology
- 10/05 - 3/07 Postdoctoral Fellow, Stanford Medical Informatics
and the National Center for BioMedical Ontology
- Summer 2003 Research Intern, Functional Genomics and Systems
Biology Group, IBM T. J. Watson research center.
- Summer 2002 Research Intern, Functional Genomics and Systems
Biology Group, IBM T. J. Watson research center.
- 1999 - 2000 Medical Internship, three months each in the
Departments of Internal Medicine, Surgery,
Obstetrics and Gynecology, and Public Health.

PUBLICATIONS

JOURNAL PAPERS

- Nigam H. Shah, Nipun Bhatia, Clement Jonquet, Daniel Rubin,
Annie P Chiang and Mark A. Musen
Comparison of Concept Recognizers for building the Open Biomedical Annotator
BMC Bioinformatics 2009, 10(Suppl 9):S14
- Noy NF, Shah NH, Whetzel PL, Dai B, Dorf M, Griffith N, Jonquet C,
Rubin DL, Storey MA, Chute CG, Musen MA
BioPortal: ontologies and integrated data resources at the click of a mouse.
Nucleic Acids Res. 2009 May 29;
- Nigam H. Shah, Clement Jonquet, Annie P. Chiang, Atul J. Butte,
Rong Chen and Mark A. Musen
Ontology-driven Indexing of Public Datasets for Translational Bioinformatics
BMC Bioinformatics 2009, 10(Suppl 2):S1
- Kotecha N, Bruck K, Lu W and Shah N.H.
Pathway Knowledge Base: An Integrated pathway resource using BioPAX
Applied Ontology, Vol 3:4, pg 235-245, December 2008
- Rubin D.L., Shah N.H. and Noy N.F.
Biomedical Ontologies: A Functional Review
Briefings in Bioinformatics, 2008 Jan;9(1):75-90.
- Marinelli R.J., Montgomery K., Liu C. L., Shah N. H., Nitzberg M.,
Zachariah Z. K., Sherlock G., Natkunam Y., West R. B., Van de Rijn M.,
Brown P.O., and Ball C.A.
The Stanford Tissue Microarray Database
Nucleic Acid Research, 2008 Jan;36(Database issue):D871-7

Shah NH, Rubin DL, Espinosa I, Montgomery K, and Musen MA
Annotation and Query of Tissue Microarray Data Using NCI-T
BMC Bioinformatics 2007, 8:296

Srinivasan BS, Shah NH, Flannick JA, Abeliuk E., Novak AF
and Batzoglou S.
Current Progress in Pathway Discovery: Towards Reference
Networks for Key Model Organisms.
Briefings in Bioinformatics, 2007, doi: 10.1093/bib/bbm038

Smith B, Ashburner M, Rosse C, Bard J, Bug W, Ceusters W, Goldberg LJ,
Eilbeck K, Ireland A, Mungall CJ; OBI Consortium, Leontis N,
Rocca-Serra P, Ruttenberg A, Sansone SA, Scheuermann RH, Shah N,
Whetzel PL, Lewis S.
The OBO Foundry: coordinated evolution of ontologies to support
biomedical data integration
Nature Biotechnology, Nov 2007, doi:10.1038/nbt1346

Racunas SA*, Shah NH* and Fedoroff NV
A case study in pathway knowledgebase verification
BMC Bioinformatics 2006, 7:196 (*= equal authors)

Racunas SA*, Shah NH*, Albert I and Fedoroff NV
HyBrow: A prototype system for computer aided hypothesis evaluation
Bioinformatics 2004 Supplement; 20: i257-i264 (*= equal authors)

Shah NH and Fedoroff NV
CLENCH: A Program for Calculating Cluster Enrichment using the
Gene Ontology, Bioinformatics. 2004 May 1;20(7):1196-7.

Shah NH, King DC, Shah PN and Fedoroff NV
A Tool-kit for cDNA microarray and promoter analysis
Bioinformatics. 2003 Sep 22;19(14):1846-8.

Mahalingam R, Shah NH, Scrymgeour A and Fedoroff NV
Temporal evolution of the Arabidopsis oxidative stress response
Plant Molecular Biology, March 2005;57(5):709-730.

Mahalingam R, Gomez-Buitrago A, Eckardt N, Shah N, Guevara-Garcia A,
Day P, Raina R, Fedoroff NV
Characterizing the stress/defense transcriptome of Arabidopsis
Genome Biology 2003, 4:R20

Jelinek DF, Tschumper RC, Stolovitzky GA, Iturria SJ, Tu Y, Lepre J,
Shah N and Kay NE
Identification of a global gene expression signature of B-chronic
lymphocytic leukemia. Mol Cancer Res. 2003 Mar;1(5):346-61.

Mitra M, Shah NH, Mueller L, Pin S and Fedoroff NV
StressDB: A locally installable web-based relational microarray
database designed for small user communities.
Comparative and Functional Genomics, 2002, 3(2): 91-96

PEER-REVIEWED CONFERENCE PAPERS

Jonquet CM, Shah NH and Musen MA.
Prototyping a Biomedical Ontology Recommender Service
Bio-Ontologies SIG at ISMB 2009, Stockholm, Sweden

Jonquet CM, Shah NH and Musen MA.
The Open Biomedical Annotator
AMIA Summit on Translational Bioinformatics, March 2009, p. 56-60.

Theobald M, Shah NH and Shrager J.
Extraction of Conditional Probabilities of the Relationships between
Drugs, Diseases, and Genes from PubMed guided by relationships in
PharmGKB.
AMIA Summit on Translational Bioinformatics, March 2009, p. 124-128.

Bhatia, N, Shah NH and Musen MA.
Comparing Concept Recognizers for Ontology-Based Indexing: MGREP vs. MetaMap
AMIA Summit on Translational Bioinformatics, March 2009, p. 12-16.

Shah N.H. and Musen M.A.
UMLS-Query: A Perl Module for Querying the UMLS.
AMIA Annu Symp Proc. 2008 Nov 6:652-6

Shah NH, Chiang AP, Butte AJ, Chen R and Musen MA.
Ontology-driven Indexing of Public Datasets for Translational Bioinformatics
AMIA Summit on Translational Bioinformatics, March 2008, p. 100-105

Jonquet C, Musen MA, Shah NH
A System for Ontology-Based Annotation of Biomedical Data
Data Integration in the Life Sciences (DILS) 2008, pp. 144-152

Moreira D, Shah NH and Musen MA
Interpretation Errors related to the GO Annotation File Format
AMIA Annu Symp Proc. 2007 Oct 11:538-42.

Alani, H., Noy, N.F., Shah, N.H., Shadbolt, N and Musen, M.A.
Searching Ontologies Based on Content: Experiments in the Biomedical Domain
Proceedings of the Fourth International Conference on Knowledge Capture (K-Cap),
pg 55-62 (ISBN:978-1-59593-643-1)

W.-J. Lee, L. Raschid, P. Srinivasan, N. Shah, D. Rubin, N. Noy
Using annotations from controlled vocabularies to find meaning associations
Lecture Notes in Bioinformatics, Vol.4544, pp.247-263, June 2007

Shah NH, Rubin DL, Supekar KS and Musen MA
Ontology-based Annotation and Query of Tissue Microarray Data
AMIA Annu Symp Proc. 2006:709-13.

Nikesh Kotecha, Kyle Bruck, William Lu and Nigam Shah
Pathway Knowledge Base: Integrating BioPAX compliant pathways
using Oracle RDF Store (W3C HCLS Workshop @ ISWC 2006)

Racunas SA, Griffin C and Shah NH
A Finite Model Theory for Biological Hypotheses
IEEE Computer Society CSB Conference, Aug 2004, Proc pg 585-589

Shah NH, Lepre J, Tu Y and Stolovitzky G
Can We Identify Cellular Pathways Implicated in Cancer
Using Gene Expression Data?
IEEE Computer Society CSB Conference, Aug 2003, Proc pg 94 - 103

Racunas SA, Shah NH and Fedoroff NV
A Contradiction-Based Framework for Testing Gene Regulation Hypotheses
IEEE Computer Society CSB Conference, Aug 2003, Proc pg 634 - 638

TECHNICAL REPORTS

Shah NH, and Mark A. Musen
Which Annotation did you mean?
Stanford Medical Informatics Technical Report, SMI-2007-1247, May 2007

Shah NH, and Mark A. Musen
UMLS-Query: A Perl Module for Querying the UMLS
Stanford Medical Informatics Technical Report, SMI-2007-1242, March 2007

Shah NH, Mark A. Musen and Nina V. Fedoroff
Clench2.0: Cluster enrichment analysis and visualization of expression,
annotation and transcription factor binding site data
Stanford Medical Informatics Technical Report, SMI-2006-1248, Aug 2006

BOOK CHAPTERS

Ontologies in support of formal representations of biological systems in The Handbook on Ontologies, (second edition)
Editors: Stephen Staab and Rudi Studer

Biomedical Data/Content Acquisition, Curation.
in the Encyclopedia of Database Systems, (Springer Verlag)
Area Editor: Vipul Kashyap

RESEARCH SUMMARY

My graduate work was focused on developing formal methods for the representation, manipulation and integration of diverse biological data - such as gene expression, protein interactions & annotations - with prior biological knowledge for the purpose of evaluating alternative hypotheses. The prototype system is available at www.hybrow.org.

My current research (at the National Center for Biomedical Ontology, www.bioontology.org) is focused on developing methods and tools for ontology based annotation of biomedical datasets in order to enable translational research.

Apart from my research work, I have experience managing large scale microarray data, teaching microarray data analysis techniques to faculty and students, and have trained in medicine. I am also familiar with basic concepts and methods in mathematical modeling of biological systems as a result of my graduate course work at Penn State and training at the SantaFe institute.

TEACHING EXPERIENCE

Apr - 2009	Instructor for the course, "Informatics in Industry" http://bmi206.stanford.edu/ (Biomedin 206)
Dec - 2008	Instructure for "Developing biomedical ontologies using protege" at the WHO-ICF development workshop, Nottwil, Switzerland.
Jul - 2008	Instructor for "How to Make Useful Ontologies for Biomedicine" at ISMB 2008, Toronto, Canada.
Jul - 2007	Instructor for "Ontologies for Biomedicine - How to make and use them" at ISMB 2007, Vienna, Austria.
Jun - 2007	Instructor in "Reasoning with Biomedical Information - Training Course in Logic for Biomedical Research" at Schloss Dagstuhl, Germany.
Jan - 2007	Instructor for "Preparation for Expression Analysis" at the International Microarray Workshop 2007 at University of Arizona, Tucson.
Jan - 2007	Instructor for "Beyond Single Gene Analysis" at the International Microarray Workshop 2007 at University of Arizona, Tucson.
Aug - 2006	Instructor for "Ontologies for Biomedicine" tutorial at Computational Systems Bioinformatics Conference 2006.
2005 - 06	Guest Lecturer in BMI 210, 211 and 234 at Stanford.
May 30-Jun 4 '05	Instructor for Microarray Data Analysis methods in Penn State Bioinformatics workshop.
May 3-8 2004	Instructor for Microarray Data Analysis methods in Penn State Bioinformatics workshop.

- June 2-6 2003 Instructor for Microarray Data Analysis methods in Penn State Bioinformatics workshop.
- Fall 2001 Physiology Laboratory (Biology 142). Fully responsible for teaching vertebrate physiology to 34 undergraduate nursing and nutrition students.

INVITED PRESENTATIONS

- 2009 BioPortal - Ontologies and Data Resources with the Click of a Mouse, at The Asia-Pacific Congress on Electron Tomography, Jan 31 - Feb 4, Brisbane, Australia
- 2009 Ontology services for semantic application in health and life sciences at the Conference on Semantics in Health and Life Sciences (C-SHALS) Boston, Feb 25 - 27, 2009
- 2009 Ontology services for emerging publishing paradigms in the Panel on Advanced Web Technologies for Translational Informatics across Different Biomedical Domains at AMIA Summit on Translational Bioinformatics, March 2009, San Francisco
- 2007 Bio-Ontologies: current status and emerging trends at the Bridging Ontologies and Text Mining workshop at the European Bioinformatics Institute, Hinxton, UK, Sep 12-14th 2007
- 2006 Formal Structuring of Genomic Knowledge at Toward genomics knowledge representation for clinical trials Workshop, AMIA Annual Symposium, 2006
- 2004 "HyBrow: A System for computer aided hypothesis testing" at Rocky'04, Dec 10th-12th, Aspen.

WORKSHOPS & PRESENTATIONS

- 2009 "How bio-ontologies enable open science" at the Open Science workshop at the Pacific Symposium on Biocomputing 2009, Hawaii.
- 2008 Participant in the Workshop on the Relationship Ontology, May 19 - 20, Denver, CO.
- 2008 "Computations using pathways and networks" at the Workshop on Ontologies of Cellular Networks, March 27-28, 2008, Newark, NJ
- 2007 "Relationship b/w pathways and models of biological processes" BioPAX Workshop, October 15-16, 2007, Menlo Park, CA
- 2007 "Operations on pathways from different resources" BioPAX Workshop, October 15-16, 2007, Menlo Park, CA
- 2007 "Aligning and Combining Ontologies" at the workshop on Interoperability of Biomedical Ontologies March 27-30 2007, Schloss Dagstuhl, Germany
- 2006 Participant in the Anatomy Ontology Workshop September 8-9, 2006, Seattle, WA
- 2006 Participant in the Workshop on Ontology of Images March 24-25, 2006, Stanford, CA
- 2004 "HyBrow:A System for computer aided hypothesis testing" at ISMB 2004, Glasgow, Scotland.
- 2004/02 Presented at the NSF microarray research coordination network meeting at Mohonk, 08/27 to 09/1 (04) and 08/15 to 08/19 (02)

- 2003 Speaker at the Plant and Animal Genome XI Conference at San Diego 01/11 to 01/15, 2003
- 2001 Participant in Mathematical modeling in cellular and molecular biology workshop at the SantaFe institute, from 07/29 to 08/11

PROFESSIONAL SERVICE

- Co-chair for the Bio-Ontologies Workshop at ISMB 2008, 2009, 2010
- Member, Program committee for Semantic Web Applications and Tools for Life Sciences meeting - SWAT4LS 2008, 2009
- Member, Program committee for Workshop On Semantic Web Applications in Scientific Discourse at ISWC 2009
- Member, Program committee for track Databases and Ontologies at Intelligent Systems for Molecular Biology (ISMB) 2008
- Member, Program committee for the Semantic Web for Health Care and Life Sciences Workshop, at WWW conference 2008
- Member, Program committee for Workshop on Service Oriented Technologies for Biological Databases and Tools - WSDL/SCC 2007
- Member, Program committee for Workshop on Semantic E-Science - AAI2007
- Chair, Poster committee for Computational Systems Bioinformatics conference 2006
- Member of the Search committee for the Director of The Huck Institutes of the Life Sciences in 2005

REVIEWER SERVICE

- Bioinformatics
Journal of Biomedical Informatics
BMC Bioinformatics
PLoS One
- AMIA Annual Symposium
AMIA Summit on Translational Bioinformatics
Pacific Symposium on Biocomputing
Intelligent Systems in Molecular Biology
International Conference on Biomedical Ontology

PROFESSIONAL MEMBERSHIPS

- International Society for Computational Biology (ISCB)
- American Medical Informatics Association (AMIA)

GRANTS AWARDED

- SGER: Hypothesis Based Query and Verification of Pathway Models
Exploratory research grant from NSF (PI: Musen) for further research on the hypothesis browser system.
Duration: Sep 2008 - Aug 2010
Amount: \$200,000
- Developing a new bioinformatics tool for biological hypothesis testing
Seed Grant from Penn State with Steve Racunas and Nina Fedoroff.
Award of this seed grant enabled us to prototype HyBrow and provide proof-of-concept with real-world data.
Duration: Fall 2003 - Fall 2004
Amount: \$42,500

INVENTION DISCLOSURES FILED

Disclosure 2004-S098 (With Penn State University)

HyBrow - A prototype system for computer aided hypothesis evaluation

Date: February 2005

HONORS

Life Sciences Consortium Fellowship from Penn State University.
(August 2000- July 2002)