

CURRICULUM VITAE  
University of Pittsburgh  
School of Medicine

**BIOGRAPHICAL**

**Name:** Shyam Visweswaran **Citizenship:** USA  
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**EDUCATION and TRAINING**

**GRADUATE**

<b>Dates Attended</b>	<b>Name and Location of Institution</b>	<b>Degree Received and Year</b>	<b>Major Subject</b>
07/83 – 12/87	Jawaharlal Institute of Post-Graduate Medical Education and Research (JIPMER), Puducherry, India		Medicine and Surgery
02/88 – 03/89	Jawaharlal Institute of Post-Graduate Medical Education and Research (JIPMER), Puducherry, India	M.B.,B.S., 1989	Rotating internship

**POSTGRADUATE**

<b>Dates Attended</b>	<b>Name and Location of Institution</b>	<b>Degree Received or Position</b>	<b>Major Subject</b>
04/89 – 09/89	Jawaharlal Institute of Post-Graduate Medical Education and Research (JIPMER), Puducherry, India	Junior Resident	Non postgraduate
09/89 – 06/91	Jawaharlal Institute of Post-Graduate Medical Education and Research (JIPMER), Puducherry, India	Junior Resident	Anesthesiology
08/91 – 06/96	University of Illinois at Urbana-Champaign, IL	M.S., 1996	Physiology and Biophysics

07/96 – 06/97	St. Luke's - Roosevelt Medical Center, New York, NY	PGY1	Medicine Michael Greico, MD – program director
07/97 – 06/00	Boston University Medical Center, Boston, MA	PGY2 – PGY4	Neurology Robert G. Feldman, MD – program director
07/00 – 06/01	ArsDigita University, Cambridge, MA	Post- baccalaureate program	Computer Science Shai Simonson, PhD – program director
08/01 – 09/07	University of Pittsburgh, Pittsburgh, PA	Ph.D., 2007	Intelligent Systems (Biomedical Informatics track) Charles P. Friedman, PhD – program director

### APPOINTMENTS and POSITIONS

#### ACADEMIC

<b>Years Inclusive</b>	<b>Name and Location of Institution</b>	<b>Rank/Title</b>
09/89 – 07/91	Jawaharlal Institute of Post-Graduate Medical Education and Research (JIPMER), Pondicherry, India	Resident
08/91 – 06/96	University of Illinois at Urbana-Champaign, IL, USA	Research and teaching assistant in Physiology
07/96 – 06/97	St. Luke's - Roosevelt Medical Center, NY	Intern
07/97 – 06/99	Boston University School of Medicine, Boston, MA	Resident in Neurology
07/99 – 06/00	Boston University School of Medicine, Boston, MA	Chief Resident in Neurology
08/01 – 10/06	University of Pittsburgh School of Medicine Center for Biomedical Informatics and the Intelligent Systems Program	Fellow in Biomedical Informatics
11/06 – 10/15	University of Pittsburgh School of Medicine Department of Biomedical Informatics	Assistant Professor
11/15 – present	University of Pittsburgh School of Medicine Department of Biomedical Informatics	Associate Professor
01/08 – present	University of Pittsburgh Faculty of Arts and Sciences Intelligent Systems Program	Assistant Professor (secondary appointment)

06/10 – present	University of Pittsburgh Clinical and Translational Science Institute	Assistant Professor (secondary appointment)
02/11 – present	University of Pittsburgh School of Medicine Department of Computational and Systems Biology	Assistant Professor (secondary appointment)

### **NON-ACADEMIC**

<b>Years Inclusive</b>	<b>Name and Location of Institution</b>	<b>Rank/Title</b>
06/08 – present	University of Pittsburgh School of Medicine Medical Scientist Training Program	Biomedical Informatics Program Director
05/09 – 01/16	University of Pittsburgh School of Medicine Biomedical Informatics Graduate Training Program	Associate Director
05/09 – 01/16	Curriculum Committee, University of Pittsburgh School of Medicine Biomedical Informatics Graduate Training Program	Chair
04/14 – 12/15	RoboClinics, Inc., Fernley, NV	Chief Medical Advisor
09/14 – present	Clinical Informatics Department of Biomedical Informatics	Director
07/15 – 06/16	University of Pittsburgh Clinical and Translational Science Institute	Co-Director, Biomedical Informatics Core
07/16 – present	University of Pittsburgh Clinical and Translational Science Institute	Director, Biomedical Informatics Core
07/15 – present	Consortium For The Study Of Pancreatitis: Pittsburgh Clinical Center	Member, Project Planning and Analyses Group
01/16 – present	Tenured Faculty Promotions and Appointments (TFPA) Committee, University of Pittsburgh School of Medicine	Member
07/16 – 12/17	Center for Clinical Research Informatics (CCRI) Department of Biomedical Informatics	Director
09/16 – 12/17	Center for Clinical Informatics (CCI) Department of Biomedical Informatics	Co-Director
01/18 – present	Data Enabled Clinical Informatics Center (DECIC) Department of Biomedical Informatics	Director

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### **CERTIFICATION and LICENSURE**

## **SPECIALTY CERTIFICATION**

<b>Certifying Board</b>	<b>Date</b>
Educational Commission for Foreign Medical Graduates	01/28/1992
Federation Licensing Examination (FLEX)	06/15/1993
United States Medical Licensing Examination (USMLE) Step 1	06/14/1995
United States Medical Licensing Examination (USMLE) Step 2	08/30/1995

## **MEDICAL or OTHER PROFESSIONAL LICENSURE**

Pending; Board Eligible in Psychiatry and Neurology

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## **MEMBERSHIPS in PROFESSIONAL and SCIENTIFIC SOCIETIES**

<b>Organization</b>	<b>Year</b>
American Academy of Neurology	1997 – 2001, 2018 – present
American Medical Informatics Association	2001 – present
Association for the Advancement of Artificial Intelligence	2001 – present
Association of Computing Machinery	2015 – present
American Association for the Advancement of Science	2016 – present

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## **HONORS**

National Science Talent Search Scholarship, Government of India	1981 – 1991
Excellent Teacher, School of Life Sciences, University of Illinois at Champaign-Urbana	1995 – 1996
Chief Resident, Department of Neurology, Boston University School of Medicine	2000 – 2001
National Library of Medicine Fellow in Biomedical Informatics, University of Pittsburgh Medical School	2001 – 2006
Third place in the Student Paper Competition at the Annual Symposium of the American Medical Informatics Association (AMIA) for a first-authored paper	2005
Homer R. Warner research award at the Annual Symposium of the American Medical Informatics Association (AMIA) for a co-authored paper	2010

Marco Ramoni award at the AMIA Summit on Translational Bioinformatics for a co-authored paper	2011
Distinguished paper award at the AMIA Summit on Translational Bioinformatics for a co-authored paper	2012
Distinguished paper award at the AMIA Summit on Translational Bioinformatics for a co-authored paper	2013
Hattie Becich Award for Best Teacher, Department of Biomedical Informatics, University of Pittsburgh	2014
First place, American Medical Informatics Association (AMIA) Fall Symposium Student Paper Competition, Washington DC (for a last-authored paper)	2015
First place, AMIA Joint Summits Clinical Research Informatics Student Paper Competition, San Francisco, CA (for a co-authored paper)	2017

## PUBLICATIONS

### Refereed Journal Articles

1. Bartling, WC, Schleyer, TK, **Visweswaran, S**. Retrieval and classification of dental research articles. *Advances in Dental Research*. 2003 Dec; 17:115-20. PMID: 15126221 DOI: 10.1177/154407370301700126
2. McEllistrem, CM, Noller, AC, **Visweswaran S**, Adams JM, Harrison, LH. Serotype 14 variants of the France 9V-3 Clone from Baltimore, Maryland can be differentiated by the cpsB gene. *Journal of Clinical Microbiology*. 2004 Jan; 42(1):250-6. PMID: 14715761 PMCID: PMC321660
3. McEllistrem, MC, Adams, JM, **Visweswaran, S**, Khan S. Detection of very-high-level penicillin resistant variants of the Tennessee 23F-4 clone via single and serial transformations with four serotype 19A international pneumococcal clones. *Microbial Drug Resistance*. 2005 Fall; 11(3):271-8. PMID: 16201931 DOI: 10.1089/mdr.2005.11.271
4. Wong, AI, Stephens, SB, Aspinall, MB, **Visweswaran, S**, Hanlon, JT, Handler, SM. Assessing the quality of prescribing and monitoring erythropoiesis stimulating agents in the nursing home setting. *Journal of the American Medical Directors*. 2009 Jul; 10(6):436-9. PMID: 19560723 PMCID: PMC2846620
5. Lustgarten, JL, **Visweswaran, S**, Bowser, RP, Hogan, WR, Gopalakrishnan, V. Knowledge-based variable selection for rule learning on proteomic data. *BMC Bioinformatics*. 2009 Sep 17; 10 Suppl 9:S16. PMID: 19761570 PMCID: PMC2745687
6. Kalamangalam, GP, Morris, HH, Mani, J, Lachhwani, DK, **Visweswaran, S**, Bingaman, WM. Noninvasive correlates of subdural grid electrographic outcome. *Journal of Clinical Neurophysiology*. 2009 Oct; 26(5):333-41. PMID: 20168131 DOI: 10.1097/WNP.0b013e3181baaab9
7. Gopalakrishnan, V, Lustgarten, JL, **Visweswaran, S**, Cooper, GF. Bayesian rule learning for biomedical data mining. *Bioinformatics*. 2010 Mar 1; 26(5):668-75. PMID: 20080512 PMCID: PMC2852212

8. **Visweswaran, S**, Angus, DC, Hsieh, M, Weissfeld, L, Yealy, D, Cooper, GF. Learning patient-specific predictive models from clinical data. *Journal of Biomedical Informatics*. 2010 Oct; 43(5):669-85. PMID: 20450985 PMCID: PMC2933959
9. Jiang, X, Barmada, MM, **Visweswaran, S**. Identifying genetic Interactions in genome-wide data using Bayesian networks. *Genetic Epidemiology*. 2010 Sep; 34(6):575-81. PMID: 20568290 PMCID: PMC3931553
10. **Visweswaran, S**, Cooper, GF. Learning instance-specific predictive models. *Journal of Machine Learning Research*. 2010 Dec 1; 11:3369–3405. PMID: 25045325 PMCID: PMC4102007
11. Jiang, X, Neapolitan, RE, Barmada, MM, **Visweswaran, S**. Learning genetic epistasis using Bayesian network scoring criteria. *BMC Bioinformatics*. 2011 Mar 31; 12:89. PMID: 21453508 PMCID: PMC3080825
12. Wei, W, **Visweswaran, S**, Cooper, GF. The application of naive Bayes model averaging to predict Alzheimer’s disease from genome-wide data. *Journal of the American Medical Informatics Association*. 2011 Jul-Aug; 18(4):370-5. PMID: 21672907 PMCID: PMC3128400<sup>1</sup>
13. Kane-Gill, SL, **Visweswaran, S**, Saul, MI, Wong, AI, Penrod, L, Handler, SM. Computerized detection of adverse drug reactions in the medical intensive care unit. *International Journal of Medical Informatics*. 2011 Aug; 80(8):570-8. PMID: 21621453 PMCID: PMC3139253
14. Lustgarten, JL\*, **Visweswaran, S\***, Gopalakrishnan, V, Cooper, GF. Application of an efficient Bayesian discretization method to biomedical data. *BMC Bioinformatics*. 2011 Jul 28; 12:309. PMID: 21798039 PMCID: PMC3162539. \*Co-first authors
15. Mowery, D, Weibe, J, **Visweswaran, S**, Harkema, H, Chapman, WW. Building an automated SOAP classifier for emergency department reports. *Journal of Biomedical Informatics*. 2012 Feb; 45(1):71-81. PMID: 21925286 PMCID: PMC3267853
16. Bhavnani, SK, Bellala, G, Victor, S, Bassler, K, **Visweswaran, S**. The role of complementary bipartite visual analytical representations in the analysis of SNPs: A case study in ancestral informative markers. *Journal of the American Medical Informatics Association*. 2012 Jun 1; 19(e1):e5-e12. PMID: 22718038 PMCID: PMC3392853<sup>2</sup>
17. Strobl, EV, Eack, SM, Swaminathan, V, **Visweswaran, S**. Predicting the risk of psychosis onset: Advances and prospects. *Early Intervention in Psychiatry*. 2012 Nov;6(4):368-79. PMID: 22776068 PMCID: PMC3470783
18. Stokes, M, **Visweswaran, S**. Application of a spatially-weighted Relief algorithm for ranking genetic predictors of disease. *BioData Mining*. 2012 Dec 3; 5(1):20. PMID: 23198930 PMCID: PMC3554553
19. Hauskrecht, M, Batal, I, Valko, M, **Visweswaran, S**, Cooper, GF, Clermont, G. Outlier detection for patient monitoring and alerting. *Journal of Biomedical Informatics*. 2013 Feb; 46(1):47-55. PMID: 22944172 PMCID: PMC3567774

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<sup>1</sup> Awarded the Marco Ramoni Distinguished Paper Award for Translational Bioinformatics and selected as one of the best papers at the AMIA Summit on Translational Bioinformatics, 2011.

<sup>2</sup> Awarded the Distinguished Paper Award for Translational Bioinformatics and selected as one of the best papers at the AMIA Summit on Translational Bioinformatics, 2012.

20. Kalamangalam, GP, Pestana Knight, EM, **Visweswaran, S**, Gupta, A. Noninvasive predictors of subdural grid seizure localization in children with nonlesional focal epilepsy. *Journal of Clinical Neurophysiology*. 2013 Feb; 30(1):45-50 PMID: 23377441 DOI: 10.1097/WNP.0b013e31827edca4
21. Pineda AL, Tsui FC, **Visweswaran, S**, Cooper GF. Detection of patients with influenza syndrome using machine-learning models learned from Emergency Department reports. *Online Journal of Public Health Informatics*. 2013 Apr 4; 5(1):e41. PMCID: PMC3692886
22. Kimmel, C, **Visweswaran, S**. An algorithm for network-based gene prioritization that encodes knowledge both in nodes and in links. *PLoS One*. 2013 Nov 19; 8(11):e79564. PMID: 24260251 PMCID: PMC3834271
23. Stokes, ME, Barmada, MM, Kamboh, MI, **Visweswaran, S**. The application of network label propagation to rank biomarkers in genome-wide Alzheimer's data. *BMC Genomics*. 2014 Apr 14; 15(1):282. PMID: 24731236 PMCID: PMC4234455
24. Aflakparast, M, Salimi, H, Gerami, A, Dubé, M-P, **Visweswaran, S**, Masoudi-Nejad, A. Cuckoo search epistasis: A new method for exploring significant genetic interactions. *Heredity*. 2014 Jun; 112(6):666-74. PMID: 24549111 PMCID: PMC4023449
25. Aflakparast, M, Masoudi-Nejad, A, Bozorgmehr, JH, **Visweswaran, S**. Informative Bayesian Model Selection: A method for identifying interactions in genome-wide data. *Molecular BioSystems*. 2014 Aug 26; 10(10):2654-62. PMID: 25070634
26. Zaidi, AH, Gopalakrishnan, V, Kasi, PM, Malhotra, U, Balasubramanian, J, **Visweswaran, S**, Zeng, X, Sun, M, Bergman JJ, Bigbee, WL, Jobe, BA. Evaluation of a four-protein biomarker panel for detection of esophageal adenocarcinoma. *Cancer*. 2014 Dec 15; 120(24):3902-13. PMID: 25100294 PMCID: PMC4441619
27. Jordan, R, **Visweswaran, S**, Gopalakrishnan, V. Semi-automated literature mining to identify putative biomarkers of disease from multiple biofluids. *Journal of Clinical Bioinformatics*. 2014 Oct 23; 4:13. PMID: 25379168 PMCID: PMC4215335
28. Floudas, CS, Kamboh, MI, Barmada, MM, **Visweswaran, S**. Identifying genetic interactions associated with late-onset Alzheimer's disease. *BioData Mining*. 2014 Dec 19; 7(1):35. PMID: 25649863 PMCID: PMC4300162
29. Bhavnani, SK, Dang, B, Bellala, G, Divekar, R, **Visweswaran, S**, Brasier, A, Kurosky, A. Unlocking proteomic heterogeneity in complex diseases through visual analytics. *Proteomics*. 2015 Feb 13; 15(8):1405-18. PMID: 25684269 PMCID: PMC4471338
30. Kimmel, C, **Visweswaran, S**. KNGP: A network-based gene prioritization algorithm that incorporates multiple sources of knowledge. *American Journal of Bioinformatics and Computational Biology*. 2015 Apr 25; 3(1):1-4.
31. **Visweswaran, S**, Ferreira, A, Cooper, GF. Personalized modeling for prediction with decision-path models. *PLoS One*. 2015 Jun 22; 10(6): e0131022. PMID: 26098570 PMCID: PMC4476684
32. Ogoe, HA, **Visweswaran, S**, Lu, X, Gopalakrishnan, V. Knowledge transfer via classification rules using functional mapping for integrative modeling of gene expression data. *BMC Bioinformatics*. 2015 Jul 23; 16:226. PMID: 26202217 PMCID: PMC4512094

33. Pineda, AL, Ye, Y, **Visweswaran, S**, Cooper, GF, Wagner, MM, Tsui, FC. Comparison of machine learning classifiers for influenza detection from emergency department free text reports. *Journal of Biomedical Informatics*. 2015 Dec; 58:60-9. PMID: 26385375 PMCID: PMC4684714
34. Strobl, EV, **Visweswaran, S**. Markov boundary discovery with ridge regularized linear models. *Journal of Causal Inference*. 2016 Mar; 4(1):31-48. PMID: 27170915 PMCID: PMC4861166
35. Pineda, AL, Ogoe, HA, Balasubramanian, JB, Escareño, CR, **Visweswaran, S**, Herman, JG, Gopalakrishnan, V. On predicting lung cancer subtypes using 'omic' data from tumor and tumor-adjacent histologically-normal tissue. *BMC Cancer*. 2016 Mar 4;16(1):184. PMID: 26944944 PMCID: PMC4778315
36. Tenenbaum, JD, Avillach, P, Benham-Hutchins, M, Breitenstein, MK, Crowgey, EL, Hoffman, MA, Jiang, X, Madhavan, S, Mattison, JE, Radhakrishnan, N, Ray, B, Shin, D, **Visweswaran, S**, Zhao, Z, Freimuth, RR. An informatics research agenda to support precision medicine: 7 key areas. *Journal of the American Medical Informatics Association*. 2016 Jul;23(4):791-5. PMID: 27107452 PMCID: PMC4926738
37. Hauskrecht, M, Batal, I, Hong, C, Cooper, GF, **Visweswaran, S**, Clermont, G. Outlier-based detection of unusual patient-management actions: an ICU study. *Journal of Biomedical Informatics*. 2016 Dec;64:211-221. PMID: 27720983 PMCID: PMC5207478
38. Lustgarten, JL, Balasubramanian, JB, **Visweswaran, S**, Gopalakrishnan, V. Learning parsimonious classification rules from gene expression data using Bayesian networks with local structure. *Data*. 2017 Mar;2(1). PMID: 28331847 PMCID: PMC5358670
39. Culbertson, A, Goel, S, Madden, M, Safaeinili, N, Jackson, KL, Carton, T, Waitman, R, Liu, M, Krishnamurthy, A, Hall, L, Cappella, N, **Visweswaran, S**, Becich, MJ, Applegate, R, Bernstam, E, Rothman, R, Matheny, M, Lipori, G, Bian, J, Hogan, W, Bell, D, Martin, A, Grannis, S, Klann, J, Sutphen, R, O'Hara, AB, Kho, A. The building blocks of interoperability: A multisite analysis of patient demographic attributes available for matching. *Applied Clinical Informatics*. 2017 Apr 5;8(2):322-336. PMID: 28378025
40. Castro, SM, Tseytlin, E, Medvedeva, O, Mitchell, K, **Visweswaran, S**, Bekhuis, T, Jacobson, RS. Automated annotation and classification of BI-RADS assessment from radiology reports. *Journal of Biomedical Informatics*. 2017 May;69:177-187. PMID: 28428140 PMCID: PMC5706448
41. Bhavnani SK, Dang B, Kilaru V, Caro M, **Visweswaran S**, Saade G, Smith AK, Menon R. Methylation differences reveal heterogeneity in preterm pathophysiology: results from bipartite network analyses. *Journal of Perinatal Medicine*. 2017 Jun 30. PMID: 28665803
42. Tenenbaum, JD, Bhuvaneshwar, K, Gagliardi, JP, Hollis, KF, Jia, P, Ma, L, Nagarajan, R, Rakesh, G, Subbian, V, **Visweswaran, S**, Zhao, Z, Rozenblit, L. Translational bioinformatics in mental health: Open access data sources and computational biomarker discovery. *Briefings in Bioinformatics*. 2017 Nov 27.
43. Strobl, EV, **Visweswaran, S**, Spirtes, PL. Fast causal inference with non-random missingness by test-wise deletion. *International Journal of Data Science and Analytics*. 2018 Jan 9.

## Refereed Conference Proceedings



1. **Visweswaran, S**, Hanbury, P, Saul, M, Cooper, GF. Detecting adverse drug events in discharge summaries using variations on the simple Bayes model. In: *AMIA Annual Symposium Proceedings*. 2003; 2003:689-93. PMID: 14728261 PMCID: PMC1479984
2. **Visweswaran, S**, Cooper, GF. Instance-specific Bayesian model averaging for classification. In: *Advances in Neural Information Processing Systems (NIPS 2004)*. 2004:1449-56.
3. Cooper, GF, **Visweswaran, S**. Deriving the expected utility of a predictive model when the utilities are uncertain. In: *AMIA Annual Symposium Proceedings*. 2005; 2005:161-5. PMID: 16779022 PMCID: PMC1560537<sup>3</sup>
4. **Visweswaran, S**, Cooper, GF. Patient-specific models for predicting the outcomes of patients with community acquired pneumonia. In: *AMIA Annual Symposium Proceedings*. 2005; 2005:759-63. PMID: 16779142 PMCID: PMC1560580<sup>4</sup>
5. Hauskrecht, M, Valko, M, Kveton, B, **Visweswaran, S**, Cooper, GF. Evidence-based anomaly detection in clinical domains. In: *AMIA Annual Symposium Proceedings*. 2007 Oct 11; 2007:319-23. PMID: 18693850 PMCID: PMC2655918<sup>5</sup>
6. Grover, H, Lustgarten, JL, **Visweswaran, S**, Gopalakrishnan, V. Improving peptide identification via validation with intensity-based modeling of tandem mass spectra. In: *Proceedings of the International Conference on Bioinformatics, Computational Biology, Genomics and Chemoinformatics (BCBGC-08)*. 2008:56-63.
7. Lustgarten, JL, **Visweswaran, S**, Grover, H, Gopalakrishnan, V. An evaluation of discretization methods for learning rules from biomedical datasets. In: *Proceedings of the International Conference on Bioinformatics and Computational Biology (BIOCOMP-08)*. 2008 Jul 14; 2008:527-32.
8. Valko, M, Cooper, GF, Seybert, A, **Visweswaran, S**, Saul, M, Hauskrecht, M. Conditional anomaly detection methods for patient-management alert systems. In: *Proceedings of the Workshop on Machine Learning in Health Care Applications in The Twenty-Fifth International Conference on Machine Learning*. 2008 Jul 9; 2008. PMID: 25392850 PMCID: PMC4226137
9. Lustgarten, JL, Gopalakrishnan, V, Grover, H, **Visweswaran, S**. Improving classification performance with discretization on biomedical datasets. In: *AMIA Annual Symposium Proceedings*. 2008 Nov 6; 2008:445-9. PMID: 18999186 PMCID: PMC2656082
10. Handler, SM, Hanlon, JT, Perera, S, Saul, MI, Fridsma, DB, **Visweswaran, S**, Studenski, SA, Roumani, YF, Castle, NG, Nace, DA, Becich, MJ. Assessing the performance characteristics of signals used by a clinical event monitor to detect adverse drug reactions in the nursing home. In: *AMIA Annual Symposium Proceedings*. 2008 Nov 6; 2008:278-82. PMID: 18998853 PMCID: PMC2656060
11. Wadhwa, R, Fridsma, DB, Saul, MI, Penrod, LE, **Visweswaran, S**, Cooper, GF, Chapman, W. Analysis of a failed clinical decision support system for management of congestive heart failure. In: *AMIA Annual Symposium Proceedings*. 2008 Nov 6; 2008:773-7. PMID: 18999183 PMCID: PMC2655961

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<sup>3</sup> Awarded the Distinguished Paper Award at the AMIA Annual Symposium, 2005.

<sup>4</sup> Awarded Third Place in the Student Paper Competition at the AMIA Annual Symposium, 2005.

<sup>5</sup> Finalist for Best Paper Award at the AMIA Annual Symposium, 2007.

12. Lustgarten, JL, Gopalakrishnan, V, Hogan, WR, **Visweswaran, S**. Improving a knowledge base for use in proteomic data analysis. In: *Proceedings of the Intelligent Data Analysis in Medicine And Pharmacology (IDAMAP-08)*. 2008 Nov 7; 2008:87-89.
13. Wang, S, **Visweswaran, S**, Hauskrecht, M. Learning probabilistic knowledge model for document retrieval. In: *Proceedings of the International Conference on Knowledge Discovery and Information Retrieval (KDIR)*. 2009 Oct 6; 2009:60-71.
14. **Visweswaran, S**, Wong, AI, Barmada, MM. A Bayesian method for identifying genetic interactions. In: *AMIA Annual Symposium Proceedings*. 2009 Nov 14; 2009:673-7. PMID: 20351939 PMCID: PMC2815434
15. Lustgarten, JL, Gopalakrishnan, V, **Visweswaran, S**. Measuring stability of feature selection in biomedical datasets. In: *AMIA Annual Symposium Proceedings*. 2009 Nov 14; 2009:406-10. PMID: 20351889 PMCID: PMC2815476
16. Wang, S, Hauskrecht, M, **Visweswaran, S**. Gene prioritization using a probabilistic knowledge model: A case study in Alzheimer's disease. In: *Proceedings of the IEEE-BIBM Workshop on Graph Techniques for Biomedical Networks*. 2009 Nov 1; 2009.
17. Wang, S, Hauskrecht, M, **Visweswaran, S**. Candidate gene prioritization using network based probabilistic models. In: *Proceedings of the AMIA Summit on Translational Bioinformatics*. 2010.
18. Wang, J, Day, R, **Visweswaran, S**, Hogan, W. The use of semantic distance metrics to support ontology. In: *AMIA Annual Symposium Proceedings*. 2010 Nov 13; 2010:842-6. PMID: 21347097 PMCID: PMC3041307
19. Jiang, X, Neapolitan, RE, Barmada, MM, **Visweswaran, S**, Cooper, GF. A fast algorithm for learning epistatic genomic relationships. In: *AMIA Annual Symposium Proceedings*. 2010 Nov 13; 2010:341-5. PMID: 21346997 PMCID: PMC3041370
20. Cooper, GF, Hennings-Yeomans, P, **Visweswaran, S**, Barmada, MM. An efficient Bayesian method for predicting clinical outcomes from genome-wide data. In: *AMIA Annual Symposium Proceedings*. 2010 Nov 13; 2010:127-31. PMID: 21346954 PMCID: PMC3041321
21. Hauskrecht, M, Valko, M, Batal, I, Clermont, G, **Visweswaran, S**, Cooper, GF. Conditional outlier detection for clinical alerting. In: *AMIA Annual Symposium Proceedings*. 2010 Nov 13; 2010:286-90. PMID: 21346986 PMCID: PMC3041310<sup>6</sup>
22. **Visweswaran, S**, Mezger, J, Clermont, G, Hauskrecht, M, Cooper, GF. Identifying deviations from usual medical care using a statistical approach. In: *AMIA Annual Symposium Proceedings*. 2010 Nov 13; 2010:827-31. PMID: 21347094 PMCID: PMC3041340
23. Kimmel, C, Lustgarten, J, Handler, SM, Wong, AI, **Visweswaran, S**. Identifying interacting environmental factor – gene pairs. In: *Proceedings of the 5th International Symposium on Bio- and Medical Informatics and Cybernetics (BMIC 2011)*. 2011 Jul 19; 2011.
24. Sverchkov, Y, **Visweswaran, S**, Clermont, G, Hauskrecht, M, Cooper, GF. A multivariate probabilistic method for comparing two clinical datasets. In: *Proceedings of the 2nd ACM SIGHIT International Health Informatics Symposium*. 2012 Jan 28; 2012:795-800.

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<sup>6</sup> Awarded the Homer R. Warner Award at the AMIA Annual Symposium, 2012.

25. Bhavnani, SK, Drake, J, Bellala, G, Dang, B, Peng, B, Oteo, JA, Santibañez-Saenz, P, **Visweswaran, S**, Olano, JP. How cytokines co-occur across rickettsioses patients: From bipartite visual analytics to mechanistic inferences of a cytokine storm. In: *AMIA Joint Summits on Translational Science Proceedings*. 2013 Mar 18; 2013:15-9.<sup>7</sup> PMID: 24303287 PMCID: PMC3814500
26. Hauskrecht, M, **Visweswaran, S**, Cooper, GF, Clermont, G. Conditional outlier approach for detection of unusual patient care actions. In: *Proceedings of the Twenty-Seventh AAAI Conference on Artificial Intelligence*. 2013 Jul 14; 2013.
27. Ferreira, A, Cooper, GF, **Visweswaran, S**. Decision path models for patient-specific modeling of patient outcomes. In: *AMIA Annual Symposium Proceedings*. 2013 Nov 16; 2013:413-21. PMID: 24551347 PMCID: PMC3900188
28. Hauskrecht, M, **Visweswaran, S**, Cooper, GF, Clermont, G. Data-driven identification of unusual clinical actions in the ICU. In: *AMIA Annual Symposium Proceedings*. 2013 Nov 16; 2013.
29. Strobl, EV, **Visweswaran, S**. Deep multiple kernel learning. In: *Proceedings of the 12th International Conference on Machine Learning and Applications (ICMLA'13)*. 2013 Dec 4; 2013:414-17.
30. Strobl, EV, **Visweswaran, S**. Markov blanket discovery using kernel-based conditional dependence measures. In: *Proceedings of the NIPS 2013 Workshop on Large-scale Experiment Design and Inference of Causal Mechanisms*, Lake Tahoe, NV. 2013 Dec 9.
31. Bhavnani, SK, Dang, B, Caro, M, Bellala, G, **Visweswaran, S**, Asuncion, M, Divekar, R. Heterogeneity within and across pediatric pulmonary infections: From bipartite networks to at-risk subphenotypes. In: *AMIA Joint Summits on Translational Science Proceedings*. 2014 Apr 7; 2014:29-34. PMID: 25717396 PMCID: PMC4333711
32. Balasubramanian, JB, **Visweswaran, S**, Cooper, GF, Gopalakrishnan, V. Selective model averaging with Bayesian rule learning for predictive biomedicine. In: *AMIA Joint Summits on Translational Science Proceedings*. 2014 Apr 7; 2014:17-22. PMID: 25717394 PMCID: PMC4333697
33. Bhavnani, SK, Bryant, D, **Visweswaran, S**, Divekar, R, Karmarkar, A, Ottenbacher, K. How comorbidities co-occur in readmitted hip fracture patients: From bipartite networks to insights for post-discharge planning. In: *AMIA Joint Summits on Translational Science Proceedings*. 2015 Mar 23; 2015. PMID: 26306228 PMCID: PMC4525217
34. Ribeiro, GAS, Oliveira, ACM, Ferreira, ALS, **Visweswaran S**, Cooper, GF. Patient-specific modeling of medical data. In: *Proceedings of the Machine Learning and Data Mining in Pattern Recognition: 11th International Conference, MLDM 2015*. Hamburg, Germany, Jul 20-21, 2015.
35. King, AJ, Cooper, GF, Hochheiser, H, Clermont, G, **Visweswaran, S**. Development and preliminary evaluation of a prototype of a learning electronic medical record system. In: *AMIA Annual Symposium Proceedings*. 2015 Nov 17; 2015:1967-75. PMID: 26958296 PMCID: PMC4765593<sup>8</sup>
36. King, AJ, Hochheiser, H, **Visweswaran, S**, Clermont, G, Cooper, GF. Eye-tracking for clinical decision support: A method to capture automatically what physicians are viewing in the EMR. In: *AMIA Joint*

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<sup>7</sup> Awarded the Distinguished Paper Award for Translational Bioinformatics at the AMIA Summit on Translational Bioinformatics, 2013.

<sup>8</sup> Awarded First Place in the Student Paper Competition at the AMIA Annual Symposium, 2015.

*Summits on Translational Science Proceedings*. 2017 Jul 26; 2017:512-521. PMID: 28815151 PMCID: PMC5543363<sup>9</sup>

37. Bhavnani, SK, Chen, T, Ayyaswamy, A, **Visweswaran, S**, Bellala, G, Divekar, R, Bassler, KE. Enabling comprehension of patient subgroups and characteristics in large bipartite networks: Implications for precision medicine. In: *AMIA Joint Summits on Translational Science Proceedings*. 2017 Mar 27-30; 2017:21-29. PMID: 28815099 PMCID: PMC5543384
38. Strobl, EV, **Visweswaran, S**, Spirtes, P. Fast causal inference with non-random missingness by test-wise deletion. In: *2017 ACM SIGKDD Workshop on Causal Discovery*. 2017 Aug 14.
39. Tajgardoan, M, Michael M. Wagner, MW, **Visweswaran, S**, Zimmerman, RK. A novel representation of vaccine efficacy trial datasets for use in computer simulation of vaccination policy. In: *AMIA Informatics Summit Proceedings*. 2018 Mar 12-15.

### **Reviews, Editorials, Invited Published Papers, Proceedings of Conference and Symposia (not peer reviewed), White Papers, Monographs, Books and Book Chapters**

1. Jiang, X, **Visweswaran, S**, Neapolitan, RE. Mining epistatic interactions from high-dimensional data sets using Bayesian networks. In Holmes, D and Jain, L (Eds): *Foundations and Intelligent Paradigms--3*, Springer-Verlag, Berlin Heidelberg, 2011.
2. Strobl, EV, **Visweswaran, S**. Deep multiple kernel learning. *arXiv preprint arXiv:1310.3101*, 2013.
3. Strobl, EV, **Visweswaran, S**. Markov blanket ranking using kernel-based conditional dependence measures. *arXiv preprint arXiv:1402.0108*, 2014.
4. Strobl, EV, **Visweswaran, S**. Dependence versus conditional dependence in local causal discovery from gene expression data. *arXiv preprint arXiv:1407.7566*, 2014.
5. **Visweswaran, S**, Cooper, GF. Counting Markov blankets. *arXiv preprint arXiv:1407.2483*, 2014.
6. Strobl, EV, **Visweswaran, S**. Markov blanket ranking using kernel-based conditional dependence measures. *arXiv preprint arXiv:1402.0108*, 2014.
7. Jiang, X, Neapolitan, RE, Barmada, MM, **Visweswaran, S**. Learning genetic epistasis using Bayesian network scoring criteria. In Liu (Ed): *Bioinformatics: The Impact of Accurate Quantification on Proteomic and Genetic Analysis and Research*, Apple Academic Press, 2014.
8. **Visweswaran, S**. Prediction of clinical outcomes from genome-wide data. In Sinoquet, C and Mourad, R (Eds): *Probabilistic Graphical Models for Genetics, Genomics and Postgenomics*, Oxford University Press, UK, 2014.
9. Jiang X, **Visweswaran, S**, Neapolitan, RE. Scoring, searching, and evaluating Bayesian network models of gene-phenotype association. In Sinoquet, C and Mourad, R (Eds): *Probabilistic Graphical Models for Genetics, Genomics and Postgenomics*, Oxford University Press, UK, 2014.
10. Strobl, EV, Spirtes, PL, **Visweswaran, S**. Estimating and controlling the False Discovery Rate for the PC algorithm using edge-specific p-values. *arXiv preprint arXiv:1607.03975*, 2016.

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<sup>9</sup> Awarded First Place in the Student Paper Competition at the AMIA Joint Summits Clinical Research Informatics, 2017.

11. Strobl, EV, Zhang, K, **Visweswaran, S**. Approximate kernel-based conditional independence tests for fast non-parametric causal discovery. *arXiv preprint arXiv:1702.03877*, 2017.
12. Strobl, EV, **Visweswaran, S**, Spirtes, PL. Fast causal inference with non-random missingness by test-wise deletion. *arXiv preprint arXiv:1705.09031*, 2017.

### Published Abstracts

1. Marderstein, EL, Saul, M, Hanbury, P, **Visweswaran, S**, Cooper, GF, Simmons, R. A sequential text search algorithm is superior to administratively coded data in estimating wound dehiscence as a surgical patient safety indicator. *Journal of the American College of Surgeons*. 2004;199 (3, Supplement):71-2.
2. Mezger, J, **Visweswaran, S**, Hauskrecht, M, Clermont, G, Cooper, GF. A statistical approach for detecting deviations from usual medical care. In: *AMIA Annual Symposium Proceedings*. 2007 Oct 11; 2007:1051. PMID: 18694149
3. Wong, AI, **Visweswaran, S**. A Bayesian combinatorial partitioning method for analyzing gene-gene interactions. In: *Proceedings of the Sixteenth International Conference on Intelligent Systems for Molecular Biology (ISMB-08)*. 2008 Jul.
4. Lustgarten, JL, **Visweswaran, S**, Grover, H, Kimmel, CP, Ryberg, H, Bowser, RP, Gopalakrishnan, V, Hogan, WR. Using a novel resource to decrease proteomic biomarker identification time. In: *AMIA Annual Symposium Proceedings*. 2008 Nov 6; 2008:1033. PMID: 18999243
5. Wong, AI, Stephens, SB, Aspinall, MB, **Visweswaran, S**, Hanlon, JT, Handler, SM. Determining the appropriateness of prescribing and monitoring erythropoiesis stimulating agents in the nursing home setting. Presented at the annual *Celebrating research on aging and building collaborations for the future*, Pittsburgh, PA. 2008 Dec.
6. Kane-Gill, S, **Visweswaran, S**, Saul, M, Shah, J, Wong, AI, Forsberg, E, Berrios-Ortiz, R, Penrod, L, Handler, SM. Computerized detection of adverse drug reactions (ADRs) in the medical ICU. In: *Proceedings of the Society of Critical Care Medicine's (SCCM) 38th Critical Care Congress*. 2009 Mar.
7. **Visweswaran, S**, Wong, AI. Bayesian combinatorial partitioning for detecting interactions among genetic variants. In: *Proceedings of the AMIA Summit on Translational Bioinformatics*. 2009 Mar.
8. Wong, AI, Stephens, SB, Aspinall, MB, **Visweswaran, S**, Hanlon, JT, Handler, SM. Assessing the quality of prescribing and monitoring erythropoiesis stimulating agents in the nursing home setting. In: *Proceedings of the 2009 Annual Scientific Meeting of the American Geriatrics Society*. 2009 May.
9. Levin, JE, **Visweswaran, S**, Bickel, JP. Comparison of two sign-out systems at a pediatric residency program. In: *AMIA Annual Symposium Proceedings*. 2009 Nov.
10. Bickel, JP, **Visweswaran, S**, Levin, JE, Kang, Y, Hsu, YF, Zadorozhny, VI. Data warehousing and Markov modeling of children admitted with respiratory complaints. In: *AMIA Annual Symposium Proceedings*. 2009 Nov.
11. Lewis, ZL, C Mello-Thoms, C, **Visweswaran, S**, Crowley, R. Using electronic medical records to measure guideline adherence in low-resource settings. In: *Proceedings of the 13th World Congress on Medical and Health Informatics*. 2010 Sep.

12. Barmada, MM, **Visweswaran, S**, Hennings-Yeomans, P, Bui, K, Cooper, GF. Predicting patient outcomes from clinical and genome-wide data. In: *Proceedings of the 60th Annual Meeting of the American Society of Human Genetics*. 2010 Nov.
13. Um, N, **Visweswaran, S**, Espino, J, Wagner, MM. Data quality in federated disease surveillance: using variability as an indicator of quality. In: *Proceedings of the Ninth Annual Meeting of the International Society for Disease Surveillance (ISDS)*. 2010 Dec.
14. Stokes, M, **Visweswaran, S**. Sigmoid weighted ReliefF (SWRF) for ranking SNPs. In: *AMIA Joint Summits on Translational Science Proceedings*. 2011 Mar.
15. Kimmel, C, Lustgarten, J, Handler, SM, Wong, AI, **Visweswaran, S**. Clustering of genetic and environmental factors of human diseases. In: *AMIA Joint Summits on Translational Science Proceedings*. 2011 Mar.
16. Boyce, RD, **Visweswaran, S**, Day, S, Handler, SM. Are the scores produced by adverse drug event questionnaires discordant with the actual probability of a drug/adverse event association? Presented at the *2011 Clinical and Translational Research and Education Meeting, Washington, DC*. 2011 Apr.
17. Suarez-Obando, F, **Visweswaran, S**. Computer assisted diagnosis in dysmorphology: From compendiums to diagnostic systems. In: *AMIA Annual Symposium Proceedings*. 2011 Oct.
18. Stokes, M, **Visweswaran, S**. Applying a locally adaptive distance metric to Relief algorithms. In: *AMIA Annual Symposium Proceedings*. 2011 Oct.
19. Bhavnani, SK, Bellala, G, Victor, S, Abbas, M, McMicken, V, Oezguen, N, Tupa, J, **Visweswaran, S**. The role of complementary bipartite visual analytical representations in the analysis of SNPs: A case study in ancestral informative markers. In: *AMIA Joint Summits on Translational Science Proceedings*. 2012 Mar.
20. Wong, AI, SK, Bhavnani, SK, **Visweswaran, S**. Genetic variations associated with age-of-onset of Alzheimer's disease. In: *AMIA Joint Summits on Translational Science Proceedings*. 2012 Mar.
21. Wong, AI, SK, **Visweswaran, S**. Identifying and explaining outlier medication decisions. In: *Workshop on Machine Learning for Clinical Data Analysis in The Twenty-Ninth International Conference on Machine Learning (ICML 2012)*. 2012 Jun.
22. Stokes, M, **Visweswaran, S**. Network label propagation yields reproducible biomarker SNPs in Alzheimer's datasets. In: *AMIA Annual Symposium Proceedings*. 2012 Nov.
23. Bhavnani, SK, Drake, J, Dang, B, **Visweswaran, S**. Comprehension of multiple molecular pathways using 3D networks. In: *AMIA Joint Summits on Translational Science Proceedings*. 2013 Mar.
24. Drake, J, Dang, B, **Visweswaran, S**, Bhavnani, SK. Outlier detection through bipartite visual analytics. In: *AMIA Joint Summits Translational Science Proceedings*. 2013 Mar.
25. Espino, J, Wagner, MM, **Visweswaran, S**. Predicting antigenic similarity from sequence for influenza vaccine strain selection. In: *AMIA Joint Summits on Translational Science Proceedings*. 2013 Mar.
26. Stokes, ME, **Visweswaran, S**. An efficient genetic model selection algorithm to predict outcomes from genomic data. In: *AMIA Joint Summits on Translational Science Proceedings*. 2013 Mar.
27. Wong, AI, **Visweswaran, S**. A Bayesian method for ranking genes associated with late-onset Alzheimer's disease in exome data. *Journal of the American Geriatrics Society*. 2013 Apr; 61:S220.

28. Yadav, D, Saul, MI, Papachristou, GI, Whitcomb, DC, **Visweswaran, S**, Dunn, MA. Electronic health record (EHR) information is useful to predict clinically relevant outcomes in acute pancreatitis (AP). *Gastroenterology*. 2013 May; 144(5):S279.
29. **Visweswaran, S**, Saul, MI, Espino, JU, Levander, L, Swoger, JM, Regueiro, Dunn, MA. A concept recognition tool to identify the surgical complications of Crohn's disease in electronic health records. *Gastroenterology*. 2013 May; 144(5):S641-S642.
30. Pineda, AL, **Visweswaran, S**, Cooper, GF, Gopalakrishnan, V. Machine learning classification of non-small cell lung cancer subtypes from gene methylation data. Presented at the *Great Lakes Bioinformatics Conference*. 2013 May.
31. Bhavnani, SK, Dang, B, Caro, M, Saade, G, **Visweswaran, S**. Genetic differences reveal heterogeneity in spontaneous preterm birth pathophysiology: A visual analytical approach. *American Journal of Obstetrics & Gynecology*. 2014 Jan; 210(1):S343-S344.
32. Dang, B, **Visweswaran, S**, Mejias, A, Divekar, R, Bhavnani, SK. Revealing heterogeneity in gene regulation through network edge coloring: A case study in pediatric pulmonary infections. In: *AMIA Joint Summits Translational Science Proceedings*. 2014 Apr.
33. Pineda, AL, Escareño, CR, **Visweswaran, S**, Gopalakrishnan, V. Multi-omic Bayesian classification of lung adenocarcinomas and squamous cell carcinomas. In: *Proceedings of the 1st International Summer Symposium on Systems Biology*. 2014 Aug.
34. Bhavnani, SK, Dang, B, **Visweswaran, S**, Divekar, R. Inter-network cluster replication: A case study in co-occurring comorbidities. In: *AMIA Joint Summits Translational Science Proceedings*. 2015 Mar 24.
35. Amin, W, Borromeo, C, Saul, M, Becich, MJ, **Visweswaran, S**. Informatics synergies between PaTH and ACT networks. In: *AMIA Joint Summits Translational Science Proceedings*. 2015 Mar 25; 2015:294-5.
36. Bhavnani, SK, **Visweswaran, S**, Divekar, R, Bellala, G. Where is the science in big data visual analytics? From pretty pictures to transformative biomedical discoveries. In: *AMIA Joint Summits on Translational Science Proceedings*. 2015 Mar 26; 2015:19-21
37. Norman, BA, Odukoya, OK, **Visweswaran, S**. Modeling the work flow of abandoned e-prescriptions in retail chain pharmacies. In: *Industrial and Systems Engineering Research Conference*. 2015 May.
38. Bhavnani SK, Dang, B, Chen, T, Bassler, K, Divekar, R, **Visweswaran, S**. Replicability of co-occurring comorbidities: Implications for precision medicine. In: *AMIA Joint Summits on Translational Science Proceedings*. 2016 Mar 23.
39. Khatri, S, Shirey, W, Tajardo, M, **Visweswaran, S**. Patient-specific explanations of risk predictions in community acquired pneumonia. In: *AMIA Annual Symposium Proceedings*. 2017 Nov 6.
40. Calzoni, L, Clermont, G, Cooper, GF, **Visweswaran, S**, Hochheiser, H. Exploring novel graphical representations of clinical data in a learning EMR. In: *AMIA Annual Symposium Proceedings*. 2017 Nov 7.
41. Tajardo, M, **Visweswaran, S**. Patient-specific explanations from risk prediction models. AMIA 2018 Clinical Informatics Conference. Scottsdale, AZ. 2018 May 9.
42. **Visweswaran, S**. Developing a learning electronic medical record system. AMIA 2018 Clinical Informatics Conference. Scottsdale, AZ. 2018 May 9.

## Other Publications

1. **Visweswaran, S.** Learning patient-specific models from clinical data. Doctoral Dissertation, University of Pittsburgh, Sep 2007. <http://etd.library.pitt.edu/ETD/available/etd-11292007-232406/>
2. **Visweswaran, S.** Detecting adverse drug events in discharge summaries using variations on the simple Bayes model. Master's Thesis, University of Pittsburgh, Aug 2004.

## Workshop and Panel Presentations

1. Buchanan, BG, Cooper, GF, Chapman W, Hanbury P, Kayaalp M, Ramachandran M, Saul M, **Visweswaran, S.** Creating a software tool for the clinical researcher – the IPS system. Theater demonstration. In: *Symposium of the American Medical Informatics Association*. 2002; 2002:1210. PMID: PMC2244346
2. Bhavnani, SK, **Visweswaran, S,** Divekar, R, Bellala, G. Where is the science in big data visual analytics? From pretty pictures to transformative biomedical discoveries. Interactive panel discussion. In: *AMIA Joint Summits on Translational Science Proceedings*. 2015 Mar 23; 2015:19-21.
3. **Visweswaran, S,** Tenenbaum, J, Gouripeddi, R. Secondary use of data for research - EHR, omics and environmental data. Panel discussion. In: *AMIA Joint Summits on Translational Science Proceedings*. 2016 Mar 22.
4. Bhavnani, SK, Ayyaswamy, A, Chen, T, **Visweswaran, S,** Bellala, G, Kevin E. Bassler, KE. Vicinity exploration: Enabling user-driven visual search of multiple machine learning models for precision medicine. System demonstration. In: *AMIA Annual Symposium*. 2017 Nov 7.

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## PROFESSIONAL ACTIVITIES

### Medical Student Teaching

1999 – 2000      Neurology Lectures, Boston University School of Medicine

### Medical Resident/Fellow Teaching

1999 – 2000      Neurology Seminars for Residents, Boston University School of Medicine

### Graduate School Teaching

1995 – 1996      Physiology Laboratories, University of Illinois at Urbana-Champaign

2002              Teaching Assistant, Probabilistic Methods for Computer-Based Decision Support - BIOINF 2011, Pittsburgh Medical Informatics Training Program, University of Pittsburgh School of Medicine

2002 – 2003      Files, data types and variables lecturer, Programming Basics Workshop, Pittsburgh Medical Informatics Training Program, University of Pittsburgh School of Medicine



- 2007 Instructor and Co-Director, Foundations of Clinical and Public Health Informatics – BIOINF 2011 (3 credits), Biomedical Informatics Training Program, University of Pittsburgh School of Medicine
- 2008 – 2010 Instructor and Director, Foundations of Clinical and Public Health Informatics – BIOINF 2011 (3 credits), Biomedical Informatics Training Program, University of Pittsburgh School of Medicine
- 2009 – present Genomics lecturer, Foundations of Bioinformatics – BIOINF 2051, Biomedical Informatics Training Program, University of Pittsburgh School of Medicine
- 2010 – present Instructor and Course Developer, Probabilistic Methods in Artificial Intelligence – BIOINF 2119 (3 credits), Biomedical Informatics Training Program, University of Pittsburgh School of Medicine
- 2011 – present Evaluation in medical informatics lecturer, Foundations of Clinical and Public Health Informatics – BIOINF 2011, Biomedical Informatics Training Program, University of Pittsburgh School of Medicine
- 2011, 2013, 2015 National Science Foundation (NSF) lecturer, Special Topics: Grant Writing in Biomedical Informatics – BIOINF 2132, Biomedical Informatics Training Program, University of Pittsburgh School of Medicine
- 2011 Introduction to artificial intelligence lecturer, Computational and Systems Biology and Biomedical Informatics (CoSBBI) program for high school students, University of Pittsburgh School of Medicine
- 2012 Facilitator for Medical Scientist Training Program’s course Research Basis of Medical Knowledge – MSTP 5290
- 2012 Bayesian networks in human genetics lecturer, Statistical Genetics – HUGEN 2080, University of Pittsburgh Graduate School of Public Health
- 2013 Machine learning lecturer, Introduction to Artificial Intelligence – CS 1571, University of Pittsburgh Dietrich School of Arts and Sciences
- 2013 – 2014 Instructor and Course Developer, Foundations of Clinical and Public Health Informatics (Online) – BIOINF 2011 (3 credits), Biomedical Informatics Training Program, University of Pittsburgh School of Medicine
- 2013 – 2014 Genome-wide association studies lecturer, Computational and Systems Biology and Biomedical Informatics (CoSBBI) program for high school students, University of Pittsburgh School of Medicine
- 2015 Facilitator for University of Pittsburgh Medical Scientist Training Program’s course Ethics for Medical Scientists
- 2016 The Precision Medicine Initiative and Transforming Healthcare Data for Research lecturer – CMU 42-671 Precision Medicine for Bioengineers, Carnegie Mellon University
- 2017 Instructor for breakout session on Single Cell Pathways in Causal Discovery from Biomedical Data summer Short Course, June 12-15, 2017, Carnegie Mellon University, Pittsburgh, PA

## **Graduate Student Mentoring/Advising**

### Primary Research Advisor to the following graduate students for the MS degree

2009 – 2010	Jay Shah, MD, MS (obtained 2010) in Biomedical Informatics
2009 – 2010	Jonathan Bickel, MD, MS (obtained 2010) in Biomedical Informatics
2010 – 2011	Songdet Nillasithanukroh, MS (obtained 2011) in Computational and Systems Biology
2010 – 2012	Nara Um, MD, MS (obtained 2012) in Biomedical Informatics
2010 – 2012	Charalampos Floudas, MD, MS (obtained 2012) in Biomedical Informatics
2013 – 2014	Reza Sadeghian, MD, MS (obtained 2014) in Biomedical Informatics

### Primary Research Advisor to the following graduate students for the PhD degree

2009 – 2012	Chad Kimmel, PhD (obtained 2012) in Biomedical Informatics
2009 – 2014	Matt Stokes, MS (obtained 2011), PhD (obtained 2014) in Intelligent Systems Program
2010 – 2015	Arturo Lopez Pineda, MS (obtained 2012), PhD (obtained 2015) in Biomedical Informatics, served as co-advisor
2007 – 2016	An-kwok Ian Wong, MS (obtained 2009), PhD (obtained 2016) in Intelligent Systems Program
2013 – 2017	Eric V. Strobl, MS (obtained 2015), PhD (obtained 2017) in Biomedical Informatics
2016 – 2018	Joyeeta Dutta-Moscato, MS, PhD (expected 2018) in Biomedical Informatics
2017 – 2019	Mohammadamin Tajardo, MS, PhD (expected 2019) in Intelligent Systems Program

### Primary Research Advisor to the following post-doctoral associates

2009 – 2010	Xia Jiang, PhD, Post-Doctoral Associate in Biomedical Informatics, served as co-advisor
2009 – 2011	Pablo Hennings-Yeomans, PhD, Post-Doctoral Associate in Biomedical Informatics, served as co-advisor
2012 – 2013	Charalampos Floudas, MD, MS, Post-Doctoral Associate in Biomedical Informatics
2012 – 2013	Antonio Ferreira, PhD, Post-Doctoral Associate in Biomedical Informatics, served as co-advisor

### Primary Research Advisor to the following students in Medical Scientist Training Program (MSTP)

2011, 2012, 2013	Eric V. Strobl, advisor for MSTP laboratory rotation
2015, 2017	Adriana Johnson, advisor for MSTP laboratory rotation

### Career Advisor to the following students in Medical Scientist Training Program (MSTP)

2014 - 2018	Yuzhe Brian Liu, career advisor to MSTP student
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### Career Advisor to the following students in Physician Scientist Training Program (PSTP)

2017 - 2018	Nathan Sisterson, career advisor to PSTP student
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### Member of the MS Thesis Committees of the following graduate students

2009 An-kwok Ian Wong, MS – Intelligent Systems Program, Chair of Committee  
 2009 Shuguang Wang, MS – Intelligent Systems Program  
 2010 Rajiv Wadhwa, MD, MS – Biomedical Informatics Training Program  
 2010 Jay Shah, MD, MS – Biomedical Informatics Training Program, Chair of Committee  
 2010 Jonathan Bickel, MD, MS – Biomedical Informatics Training Program, Chair of Committee  
 2010 Jian Wang, MS – Biomedical Informatics Training Program  
 2010 Danielle Mowery, MS – Biomedical Informatics Training Program  
 2010 Zachary Landis Lewis, MS – Biomedical Informatics Training Program  
 2010 Saeed Amizadeh, MS – Intelligent Systems Program  
 2010 Yuriy Sverchkov, MS – Intelligent Systems Program  
 2011 Matt Stokes, MS – Intelligent Systems Program, Chair of Committee  
 2012 Nara Um, MD, MS – Biomedical Informatics Training Program, Chair of Committee  
 2012 Charalampos Floudas, MD, MS – Biomedical Informatics Training Program, Chair of Committee  
 2012 Arturo Lopez Pineda, MS – Biomedical Informatics Training Program  
 2012 Jeremy Espino, MD, MS – Intelligent Systems Program  
 2013 Henry Ogoe, MS – Biomedical Informatics Training Program  
 2013 Mahdi Pakdaman Naeini, MS – Intelligent Systems Program  
 2014 Reza Sadeghian, MD, MS – Biomedical Informatics Training Program, Chair of Committee  
 2014 Victor Ruiz Herrera, MS – Biomedical Informatics Training Program  
 2014 John Frazier, MS – Biomedical Informatics Training Program  
 2015 Andrew King, MS – Biomedical Informatics Training Program  
 2015 Eric V. Strobl, MS – MSTP & Biomedical Informatics Training Program, Chair of Committee  
 2015 Amie Draper, MS – Biomedical Informatics Training Program  
 2016 Sergio Castro Diaz, MS – Biomedical Informatics Training Program  
 2016 Diyang Xue, MS – Intelligent Systems Program  
 2017 Mohammadamin Tajardoost, MS – Intelligent Systems Program  
 2017 Bryan Andrews, MS – Intelligent Systems Program

*Member of the PhD Dissertation Committees of the following graduate students*

2009 Jonathan Lustgarten, PhD – Biomedical Informatics Training Program  
 2010 Steven M. Handler, MD, PhD – Biomedical Informatics Training Program  
 2010 Philip Ganchev, PhD – Intelligent Systems Program  
 2012 Chad Kimmel, PhD – Biomedical Informatics Training Program, Chair of Committee  
 2012 Himanshu Grover, PhD – Biomedical Informatics Training Program  
 2012 Holly Berty, PhD – Biomedical Informatics Training Program  
 2013 Eric Williams, PhD – Intelligent Systems Program  
 2014 Danielle Mowery, PhD – Biomedical Informatics Training Program  
 2014 Matt Stokes, PhD – Intelligent Systems Program, Chair of Committee  
 2014 Yuriy Sverchkov, PhD – Intelligent Systems Program  
 2015 Arturo Lopez Pineda, PhD – Biomedical Informatics Training Program  
 2015 Ying-Feng Hsu, PhD – School of Information Sciences  
 2016 Rick Jordan, PhD – Biomedical Informatics Training Program  
 2016 Henry Ogoe, PhD – Biomedical Informatics Training Program

- 2016 Lujia Chen, PhD – Biomedical Informatics Training Program
- 2016 An-kwok Ian Wong, PhD – Intelligent Systems Program, Chair of Committee
- 2016 Mahdi Pakdaman Naeini, PhD – Intelligent Systems Program
- 2017 Andrew King, PhD – Biomedical Informatics Training Program (expected)
- 2017 Eric V. Strobl, PhD – MSTP & Biomedical Informatics Training Program
- 2017 Joyeeta Dutta-Moscato, PhD – Biomedical Informatics Training Program (expected)
- 2018 Shuguang Wang, PhD – Intelligent Systems Program (expected)
- 2018 Victor Ruiz Herrera, PhD – Biomedical Informatics Training Program (expected)
- 2018 Yuzhe Brian Liu, PhD – MSTP & Biomedical Informatics Training Program (expected)
- 2018 Amie Barda, PhD – Biomedical Informatics Training Program (expected)

*Member of the Comprehensive Examination Committee of the following graduate students*

- 2008 Thankam Thyvalikakath – Biomedical Informatics Training Program
- 2008 Eric Williams – Intelligent Systems Program
- 2008 Himanshu Grover – Biomedical Informatics Training Program
- 2009 Chad Kimmel – Biomedical Informatics Training Program, Chair of Committee
- 2009 An-kwok Ian Wong – Intelligent Systems Program, Chair of Committee
- 2010 Richard Wilson – Biomedical Informatics Training Program
- 2010 Shuguang Wang – Intelligent Systems Program
- 2011 Hatice Ulku Osmanbeyoglu – Biomedical Informatics Training Program, Chair of Committee
- 2011 Zach Landis Lewis – Biomedical Informatics Training Program
- 2011 Danielle Mowery – Biomedical Informatics Training Program
- 2011 Matt Stokes – Intelligent Systems Program, Chair of Committee
- 2012 Kevin McDade – Biomedical Informatics Training Program
- 2012 Katrina Romagnoli – Biomedical Informatics Training Program
- 2013 Rick Jordan – Biomedical Informatics Training Program
- 2013 Yuriy Sverchkov – Intelligent Systems Program
- 2014 Henry Ogoe – Biomedical Informatics Training Program
- 2014 Mahdi Pakdaman Naeini – Intelligent Systems Program
- 2015 Amie Draper – Biomedical Informatics Training Program
- 2016 Andrew King – Biomedical Informatics Training Program
- 2016 Eric V. Strobl – MSTP & Biomedical Informatics Training Program, Chair of Committee
- 2016 Victor Ruiz Herrera – Biomedical Informatics Training Program
- 2016 Gaurav Trivedi – Intelligent Systems Program
- 2016 Diyang Xue – Intelligent Systems Program
- 2017 Jeya Balasubramanian – Intelligent Systems Program
- 2017 Fattaneh Jabbari – Intelligent Systems Program
- 2017 Sanghoon Lee – Biomedical Informatics Training Program, Chair of Committee

**Other Mentoring/Advising**

- 2011 Research mentor to Edward Nguyen, high school student, *University of Pittsburgh Cancer Institute Summer Academy and the Computational and Systems Biology and Biomedical Informatics (CoSBBI)*

- program for high school students – project titled “Using a Bayesian network to learn the parameters of Alzheimer’s patient data in order to diagnosis new patients.”
- 2013 Research mentor to Amy McMillen, high school student, *University of Pittsburgh Cancer Institute Summer Academy and the Computational and Systems Biology and Biomedical Informatics (CoSBBI)* program for high school students – project titled “Machine learning for biomarker-based prediction of Alzheimer’s disease progression.”
- 2017 Research mentor to Shaina Khatri, high school student, *University of Pittsburgh Cancer Institute Summer Academy and the Computational and Systems Biology and Biomedical Informatics (CoSBBI)* program for high school students – project titled “Patient-specific explanations of random forest model risk prediction in community-acquired pneumonia.”
- 2017 Informatics mentor to Lorne Walker, MD, PhD, Pediatric Infectious Disease Fellow
- 2017 Informatics mentor to Jonathan Arnold, MD, MSE, Clinical Instructor of Medicine
- 2017 Research Advisor to Chandramouli Ratham, MS, School of Medicine’s Bioengineering, Biotechnology, and Innovation Area of Concentration

### **Awards for Students/Fellows (Primary Research Advisor or Co-Advisor)**

- 2010, 2011 Chad Kimmel, doctoral student, Biomedical Informatics Training Program, University of Pittsburgh – awarded a TL1 Pre-Doctoral Fellowship in Clinical and Translational Research
- 2011 An-kwok Ian Wong, doctoral student, Intelligent Systems Program – awarded Scholarship in Medical Student Training in Aging Research (MSTAR) Program
- 2013 Eric V. Strobl, doctoral student, MSTP – won the Best Poster prize for Deep learning and causal discovery at the 2013 BMI Training Program Retreat
- 2013 Matt Stokes, doctoral student, Intelligent Systems Program – won the Best Paper prize at the 2013 BMI Training Program Retreat
- 2013 Matt Stokes, doctoral student, Intelligent Systems Program – invited to present his work on Feature selection for biomarker discovery in genome-wide SNP data at the meeting of the NLM Board of Regents
- 2014 Eric V. Strobl, doctoral student, MSTP – won the Best Paper prize at the 2014 BMI Training Program Retreat
- 2017 Eric V. Strobl, doctoral student, MSTP – awarded the Roth Fellowship by Department of Psychiatry, University of Pittsburgh

### **Invited Lectures / Seminars / Presentations**

- 2003 **Visweswaran, S.** Adverse drug events detection in discharge summaries. Presentation at the *Faculty and Trainees Poster Session: Sampler of Key Research Areas. Pittsburgh Biomedical Informatics Training Program Annual Retreat*. University of Pittsburgh, Pittsburgh PA. August 2003.
- 2003 **Visweswaran, S,** Hanbury, P, Saul, M, Cooper, GF. Detecting adverse drug events in discharge summaries using variations on the simple Bayes model. Paper presentation at the *AMIA Annual Symposium*. Washington, DC. November 2003.
- 2004 **Visweswaran, S.** Learning patient-specific models for predicting outcomes under uncertainty. Presentation at the *NLM Informatics Training Conference*. Indianapolis, IN. June 2004.
- 2004 **Visweswaran, S,** Cooper, GF. Instance-specific Bayesian model averaging for classification. Poster

- presentation at the *Advances in Neural Information Processing Systems*. Vancouver, Canada. December 2004.
- 2005 **Visweswaran, S.** Patient-specific predictive modeling. Presentation at the *Machine Learning Lunch Seminar*. Carnegie Mellon University, Pittsburgh PA. October 2005.
- 2005 **Visweswaran, S,** Cooper, GF. Patient-specific models for predicting the outcomes of patients with community acquired pneumonia. Paper presentation at the *AMIA Annual Symposium*. Washington, DC. October 2005.
- 2006 **Visweswaran, S.** Patient-specific models for predicting the outcomes of patients with community acquired pneumonia. Presentation at the *Biomedical Informatics Colloquium Series*. University of Pittsburgh, Pittsburgh PA. January 2006.
- 2008 **Visweswaran, S.** Personalized medicine: the future paradigm. Presentation at the *Scientific Session of the Annual Alumni Meet*. Jawaharlal Institute of Post-Graduate Medical Education and Research (JIPMER), Puducherry, India. August 2008.
- 2008 **Visweswaran, S.** Personalized medicine in the era of genomics. Presentation at the *Biomedical Informatics Colloquium Series*. University of Pittsburgh, Pittsburgh PA. September 2008.
- 2009 Wong, AI, **Visweswaran, S.** Bayesian combinatorial partitioning for detecting interactions among genetic variants. Poster presentation at the *AMIA Summit on Translational Bioinformatics*. San Francisco, CA. March 2009.
- 2009 **Visweswaran, S,** Wong, AI, Barmada, MM. A Bayesian method for identifying genetic interactions. Paper presentation at the *AMIA Annual Symposium*. San Francisco, CA. November 2009.
- 2010 **Visweswaran, S,** Mezger, J, Clermont, G, Hauskrecht, M, Cooper, GF. Identifying deviations from usual medical care using a statistical approach. Paper presentation at the *AMIA Annual Symposium*. Washington, DC. November 2010.
- 2011 **Visweswaran, S.** Patient-specific modeling. Presentation at the *Intelligent Systems Program (ISP) AI Seminar*. University of Pittsburgh, Pittsburgh PA. September 2011.
- 2013 **Visweswaran, S,** Saul, MI, Espino, JU, Levander, L, Swoger, JM, Regueiro, Dunn, MA. A concept recognition tool to identify the surgical complications of Crohn's disease in electronic health records. Poster presentation at the *Digestive Disease Week (DDW) 2013*. Orlando, FL. May 2013.
- 2013 **Visweswaran, S.** Genomics: Current and future. Presentation at the *Scientific Session of the Fourteenth Biennial JIPMER Alumni Association of North America (JAANA) Meet*. Boston, MA. August 2013.
- 2013 **Visweswaran, S.** Genomics: Current and future. Presentation at the *Biomedical Informatics Colloquium Series*. University of Pittsburgh, Pittsburgh PA. September 2013.
- 2014 **Visweswaran, S.** Patient-specific prediction with decision-path models. Presentation at the *University Showcase, NLM Informatics Training Conference*. University of Pittsburgh, Pittsburgh PA. July 2014.
- 2015 Bhavnani, SK, **Visweswaran, S,** Divekar, R, Bellala, G. Where is the science in big data visual analytics? From pretty pictures to transformative biomedical discoveries. Interactive panel presentation in the *AMIA Joint Summits on Translational Science*. San Francisco. March 2015.
- 2015 **Visweswaran, S.** Building the Accrual of patients to Clinical Trials (ACT) network. Presentation at the *Pittsburgh Biomedical Informatics Training Program Annual Retreat*. University of Pittsburgh, Pittsburgh PA. August 2015.
- 2016 **Visweswaran, S.** Personalized modeling for prediction with decision-path models. Presentation at the *Critical Care Medicine Weekly Research Conference*. University of Pittsburgh, Pittsburgh PA.

- February 2016.
- 2016 **Visweswaran, S**, Tenenbaum, J, Gouripeddi, R. Secondary use of data for research - EHR, omics and environmental data. Panel presentation in the *AMIA Joint Summits on Translational Science*. San Francisco. March 2016.
- 2016 **Visweswaran, S**. Interoperability, Health Information Exchanges and Clinical Data Research Networks. Presentation at the *Big Data and Healthcare Analytics – A Path to Personalized Medicine*. University of Pittsburgh, Pittsburgh PA. May 2016.
- 2016 **Visweswaran, S**. The Precision Medicine Initiative and personalized modeling for precision medicine. Presentation at the *Spotlight Session 5: Personalized and Precision Medicine, Science 2016*. University of Pittsburgh, Pittsburgh PA. October 2016.
- 2016 **Visweswaran, S**. The Precision Medicine Initiative and personalized modeling for precision medicine. Presentation at the *Health Services Research Seminar*. University of Pittsburgh, Pittsburgh PA. October 2016.
- 2016 **Visweswaran, S**. Center for Causal Discovery (CCD) of Biomedical Knowledge from Big Data. Presentation at the *q-Bio event: Celebrating Pittsburgh's Biomedical Modeling Community*. University of Pittsburgh, Pittsburgh PA. November 2016.
- 2017 **Visweswaran, S**. Artificial intelligence in medicine. Presentation at the *University of Pittsburgh Medical Scientist Training Program Workshop*. University of Pittsburgh, Pittsburgh PA. March 2017.
- 2017 **Visweswaran, S**. Reuse of electronic medical record (EMR) data. Presentation at the *Spotlight Session 2: Big Data, Machine Learning, and Artificial Intelligence, Science 2017*. University of Pittsburgh, Pittsburgh PA. October 2017.
- 2017 Bhavnani, SK, Ayyaswamy, A, Chen, T, **Visweswaran, S**, Bellala, G, Kevin E. Bassler, KE. Vicinity exploration: Enabling user-driven visual search of multiple machine learning models for precision medicine. System demonstration at the *AMIA Annual Symposium*. November 2017.
- 2017 **Visweswaran, S**. A learning electronic medical record system: Providing decision support using machine learning. Presentation at the *STEM Junction Symposium*. Fox Chapel Area High School, Pittsburgh PA. November 2017.

## RESEARCH

### Current Research Support

Funding Agency:	NIH/NCATS
Grant/Contract No.:	UL1 TR001857-01S1
Title of Project:	<u>ACT (Accrual to Clinical Trials) network</u>
Principal Investigator:	Steven E. Reis
Visweswaran Role in Grant:	Co-Investigator
Percent of Effort:	10%
Entire Project Period:	09/23/2016 – 05/31/2021
Entire Project Directs:	\$124,291 (Informatics portion)
Entire Projects Indirects:	\$63,484 (Informatics portion)
Total Project Funding:	\$187,775 (Informatics portion)

Funding Agency: NIH/NIGMS  
Grant/Contract No.: R35 GM119519  
Title of Project: Sepsis Endotyping Using Clinical and Biological Data  
Principal Investigator: Christopher W. Seymour  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 2.5%  
Entire Project Period: 08/02/2016 – 05/31/2021  
Entire Project Directs: \$249,961  
Entire Projects Indirects: \$127,419  
Total Project Funding: \$377,380

Funding Agency: NIH  
Grant/Contract No.: UG3 OD023153  
Title of Project: Precision Approach to healthCARE enrollment Site (PA CARES)  
PD/PIs: Steven E. Reis, Shyam Visweswaran, Oscar C. Marroquin  
Visweswaran Role in Grant: PD/PI  
Percent of Effort: 15%  
Entire Project Period: 07/06/2016 – 06/30/2021  
Entire Project Directs: \$2,700,000  
Entire Projects Indirects: \$1,495,725  
Total Project Funding: \$4,195,725

Funding Agency: NIH/NLM  
Grant/Contract No.: R01 LM012095  
Title of Project: Development and Evaluation of a Learning Electronic Medical Record System  
Principal Investigator: Shyam Visweswaran  
Visweswaran Role in Grant: Principal Investigator  
Percent of Effort: 40%  
Entire Project Period: 09/15/2015 – 06/30/2019  
Entire Project Directs: \$291,865  
Entire Projects Indirects: \$156,108  
Total Project Funding: \$447,973

Funding Agency: NIH/NCATS  
Grant/Contract No.: UL1 TR001857  
Title of Project: Biomedical Informatics Core, Clinical and Translational Science Institute  
Principal Investigator: Steven E. Reis  
Visweswaran Role in Grant: Director, Biomedical Informatics Core  
Percent of Effort: 10%  
Entire Project Period: 07/01/2016 – 05/31/2021  
Entire Project Directs: \$586,793 (Informatics portion)  
Entire Projects Indirects: \$316,868 (Informatics portion)  
Total Project Funding: \$903,661 (Informatics portion)



Funding Agency: NIH/NHGRI  
Grant/Contract No.: U54 HG008540  
Title of Project: Center for Causal Modeling and Discovery of Biomedical Knowledge from Big Data  
PD/PIs: Gregory F. Cooper, Ivet Bahar, Jeremy Berg  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 10%  
Entire Project Period: 09/15/2014 – 06/30/2018  
Total Project Funding: \$7,924,466

Funding Agency: NIH/NIGMS  
Grant/Contract No.: R01 GM088224  
Title of Project: Detecting Deviations in Clinical Care in ICU Data Streams  
PD/PIs: Gilles Clermont, Milos Hauskrecht, Gregory F. Cooper  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 8%  
Entire Project Period: 01/01/2014 – 12/31/2018  
Total Project Funding: \$142,453

### **Pending**

Funding Agency: NIH / NCI  
Grant/Contract No.: R01  
Title of Project: Leveraging Twitter to Monitor Nicotine and Tobacco-Related Cancer Communication  
Principal Investigator: Brian A. Primack  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 10%  
Entire Project Period: 01/01/2018 – 12/31/2023

Funding Agency: NIH / NCATS  
Grant/Contract No.: U01  
Title of Project: Implementing, Evaluating and Disseminating a Fitness Dashboard for Federated Clinical Data Networks  
PD/PIs: Douglas Bell  
Visweswaran Role in Grant: Site PI  
Percent of Effort: 5%  
Entire Project Period: 01/01/2018 – 12/31/2023

### **Completed Support**

Funding Agency: NIH/NCATS  
Grant/Contract No.: UL1 TR000005

Title of Project: Biomedical Informatics Core, Clinical and Translational Science Institute  
Principal Investigator: Steven E. Reis  
Visweswaran Role in Grant: Co-Director, Biomedical Informatics Core  
Percent of Effort: 20%  
Entire Project Period: 07/01/2015 – 06/30/2016  
Entire Project Directs: \$463,409 (Informatics portion)  
Entire Projects Indirects: \$231,703 (Informatics portion)  
Total Project Funding: \$695,112 (Informatics portion)

Funding Agency: PCORI  
Grant/Contract No.: CDRN 1306-04912  
Title of Project: A PaTH towards a Learning Health System in the Mid-Atlantic Region  
Principal Investigator: Kathleen McTigue  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 10%  
Entire Project Period: 01/01/2014 – 06/30/2016  
Entire Project Directs: \$977,250  
Entire Projects Indirects: \$382,352  
Total Project Funding: \$1,359,602

Funding Agency: NIH/NLM/NIDCR  
Grant/Contract No.: T15 LM007059  
Title of Project: Pittsburgh Biomedical Informatics Training Program  
Principal Investigator: Rebecca Crowley  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 5%  
Entire Project Period: 07/01/2012 – 06/30/2016  
Entire Project Directs: \$5,800,093  
Entire Projects Indirects: N/A  
Total Project Funding: \$5,800,093

Funding Agency: NIH/NCATS  
Grant/Contract No.: UL1 TR000005-09S1  
Title of Project: CTSAacts (Clinical and Translational Science Accrual to Clinical Trials)  
Principal Investigator: Steven E. Reis  
Visweswaran Role in Grant: Informatics PI  
Percent of Effort: 25%  
Entire Project Period: 07/01/2014 – 06/30/2015  
Entire Project Directs: \$187,103 (Informatics portion)  
Entire Projects Indirects: \$96,446 (Informatics portion)  
Total Project Funding: \$283,549 (Informatics portion)

Funding Agency: NIH/NIGMS  
Grant/Contract No.: R01 GM100387

Title of Project: Transfer Rule Learning for Knowledge Based Biomarker Discovery and Predictive Biomedicine  
Principal Investigator: Vanathi Gopalakrishnan  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 20%  
Entire Project Period: 07/01/2012 – 06/30/2015  
Entire Project Directs: \$200,000  
Entire Projects Indirects: \$102,234  
Total Project Funding: \$302,234

Funding Agency: NIH/NLM  
Grant/Contract No.: R01 LM010950  
Title of Project: Bayesian Rule Learning Methods for Disease Prediction and Biomarker Discovery  
Principal Investigator: Vanathi Gopalakrishnan  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 10%  
Entire Project Period: 08/15/2011 – 06/30/2015  
Entire Project Directs: \$228,739  
Entire Projects Indirects: \$107,129  
Total Project Funding: \$335,868

Funding Agency: Department of Defense  
Grant/Contract No.: W81XWH-11-2-0133  
Title of Project: Framework for Smart Electronic Health Record-Linked Predictive Models to Optimize Care for Complex Digestive Diseases  
Principal Investigator: Michael A. Dunn  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 20%  
Entire Project Period: 07/01/2010 – 06/30/2014  
Entire Project Directs: \$56,707  
Entire Projects Indirects: \$29,204  
Total Project Funding: \$85,911

Funding Agency: NIH/NLM  
Grant/Contract No.: HHSN276201000030C  
Title of Project: Optimal Influenza Vaccine Strain Selection  
Principal Investigator: Shyam Visweswaran  
Visweswaran Role in Grant: Principal Investigator  
Percent of Effort: 25%  
Entire Project Period: 09/27/2010 – 09/26/2012  
Entire Project Directs: \$255,631  
Entire Projects Indirects: \$125,054  
Total Project Funding: \$380,715

Funding Agency: University of Pittsburgh  
Grant/Contract No.: ICRE Predoctoral Fellowship  
Title of Project: Identification of genetic and environmental factors of disease from literature  
Principal Investigator: Chad Kimmel  
Visweswaran Role in Grant: Mentor  
Percent of Effort: Donated  
Entire Project Period: 07/01/2010 – 06/30/2011  
Entire Project Directs: \$22,976  
Entire Projects Indirects: N/A  
Total Project Funding: \$22,976

Funding Agency: NIH/NLM/NIDR  
Grant/Contract No.: T15 LM007059-24S1  
Title of Project: Pittsburgh Biomedical Informatics Training Program NLM 2010 Curriculum Supplement  
Principal Investigator: Rebecca Crowley  
Visweswaran Role in Grant: Co-investigator  
Percent of Effort: 5%  
Entire Project Period: 07/01/2010 – 06/30/2011  
Entire Project Directs: \$200,000  
Entire Projects Indirects: \$16,000  
Total Project Funding: \$216,000

Funding Agency: National Science Foundation  
Grant/Contract No.: IIS-0911032  
Title of Project: III: Large: Discovering Complex Anomalous Patterns in Data  
Principal Investigator: Artur Dubrawski  
Visweswaran Role in Grant: Consultant  
Percent of Effort: 5%  
Entire Project Period: 09/01/2009 – 08/31/2014  
Entire Project Directs: \$1,606,670  
Entire Projects Indirects: \$341,945  
Total Project Funding: \$1,948,615

Funding Agency: NIH/NIGMS  
Grant/Contract No.: R01 GM088224  
Title of Project: Detecting Deviations in Clinical Care in ICU Data Streams  
PD/PIs: Milos Hauskrecht, Gilles Clermont  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 10%  
Entire Project Period: 09/01/2009 – 06/30/2012  
Entire Project Directs: \$1,044,337

Entire Projects Indirects: \$517,233  
Total Project Funding: \$1,561,570

Funding Agency: NIH/NLM  
Grant/Contract No.: R01 LM010020  
Title of Project: Predicting Patient Outcomes from Clinical and Genome-Wide Data  
Principal Investigator: Gregory F. Cooper  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 10%  
Entire Project Period: 09/01/2009 – 08/31/2012  
Entire Project Directs: \$767,187  
Entire Projects Indirects: \$395,101  
Total Project Funding: \$1,162,288

Funding Agency: NIH/NLM  
Grant/Contract No.: R01 LM010019  
Title of Project: Using Medical Records Repositories to Improve the Design of Alerting Systems  
Principal Investigator: Milos Hauskrecht  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 5%  
Entire Project Period: 09/30/2009 – 09/29/2013  
Entire Project Directs: \$759,306  
Entire Projects Indirects: \$378,373  
Total Project Funding: \$1,137,679

Funding Agency: NIH/NLM/NIDR  
Grant/Contract No.: T15 LM007059 23S1  
Title of Project: University of Pittsburgh Training Program Supplemental  
Principal Investigator: Rebecca Crowley  
Visweswaran Role in Grant: Co-investigator  
Percent of Effort: 5%  
Entire Project Period: 07/01/2009 – 06/30/2011  
Entire Project Directs: \$1,041,647  
Entire Projects Indirects: N/A  
Total Project Funding: \$1,041,647

Funding Agency: AHRQ  
Grant/Contract No.: R01 HS018721  
Title of Project: Enhancing the Detection and management of Adverse Drug Events in the Nursing Home  
Principal Investigator: Steven M. Handler  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 5%

Entire Project Period: 05/01/2010 – 04/30/2014  
Entire Project Directs: \$1,992,614  
Entire Projects Indirects: N/A  
Total Project Funding: \$1,992,614

Funding Agency: NIH  
Grant/Contract No.: KL2 RR024154  
Title of Project: Using a Clinical Event Monitor to Detect Adverse Drug Reactions in Long-Term Care

Principal Investigator: Steven E. Reis  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 5%  
Entire Project Period: 07/01/2005 – 06/30/2010  
Entire Project Directs: \$560,020  
Entire Projects Indirects: N/A  
Total Project Funding: \$560,020

Funding Agency: University of Pittsburgh Medical Center eRecord Quality and Safety Initiative Program

Grant/Contract No.: N/A  
Title of Project: Computerized Detection of Adverse Drug Events in the MICU

Principal Investigator: Steven M. Handler  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 5%  
Entire Project Period: 07/01/2007 – 06/30/2008  
Entire Project Directs: \$30,000  
Entire Projects Indirects: N/A  
Total Project Funding: \$30,000

Funding Agency: NIH/NLM  
Grant/Contract No.: R01 LM008374  
Title of Project: Learning Patient-Specific Models from Clinical Data

Principal Investigator: Gregory F. Cooper  
Visweswaran Role in Grant: Co-Investigator  
Percent of Effort: 20%  
Entire Project Period: 01/24/2005 – 01/23/2009  
Entire Project Directs: \$602,741  
Entire Projects Indirects: \$252,005  
Total Project Funding: \$854,746

Funding Agency: NIH/NLM/NIDCR  
Grant/Contract No.: T15 LM/DE07059  
Title of Project: Pittsburgh Biomedical Informatics Training Program  
Principal Investigator: Gregory F. Cooper

Visweswaran Role in Grant: Fellow Awardee  
 Percent of Effort: N/A  
 Entire Project Period: 07/01/1987 – 06/30/2017 (grant period covered 07/01/2001 – 06/30/2005)  
 Entire Project Directs: \$3,600,000  
 Entire Projects Indirects: N/A  
 Total Project Funding: \$3,600,000

### Patents and Copyrights

1. **Visweswaran, S.** A Rule-Based Expert System to Detect Adverse Drug Reactions in the Nursing Home Setting. Copyright protection awarded by the University of Pittsburgh (UPITT Case No. 01586) on October 18, 2007.
2. Bhavnani, SK, Bassler, KE, **Visweswaran, S.** Computer-Implementable Algorithms for Biomarker Discovery Using Bipartite Networks. US Patent No. 20130245959, filed March 14, 2013.
3. Hauskrecht, M, Cooper, GF, Clermont, **Visweswaran, S.** Clinical Alerting of Unusual Patient-Care Management Based on Machine Learning of Usual Patient-Care Management. Pitt Ref No. 03454, filed 24 November, 2014.
4. **Visweswaran, S.**, Cooper, GF, Hochheiser, HS, King, AJ. Learning Electronic Medical Record System. Pitt Ref No. 03676, filed 23 July, 2015.
5. Lu, X, Cai, C, Cooper, GF, **Visweswaran, S.** Identification of Somatic Gene Alterations with Functional Impact. Pitt Ref No. 03757, filed 2016.

### Other Research Related Activities

#### Journal Editorial Boards

2007 – present International Journal of Medical Engineering and Informatics (IJMEI)  
 2017 – present Artificial Intelligence in Medicine

#### Journal Refereeing

2005, 2010 Artificial Intelligence in Medicine  
 2007 PLoS Medicine  
 2009 IEEE Transactions on Information Theory  
 2009 – 2010 Computers in Biology and Medicine  
 2009 – 2010 PLoS Computational Biology  
 2010 Medical Decision Making  
 2010 – 2011 PLoS ONE  
 2011 Science Translational Medicine  
 2011 – 2014, 2016 Journal of Biomedical Informatics  
 2012 IIE Transactions on Healthcare Systems Engineering  
 2012 Annals of Neurology  
 2012 – 2013 Statistics in Medicine

2012 – 2015 Journal of the American Medical Informatics Association  
2013 Journal of Pathology Informatics  
2013 PeerJ  
2014 Applied Clinical Informatics

#### Conference Refereeing

2006 Conference on Uncertainty in Artificial Intelligence  
2007 – 2017 AMIA Annual Symposium  
2011 International Joint Conference on Artificial Intelligence  
2011 – 2012 Summit on Translational Bioinformatics  
2012 Summit on Clinical Research Informatics  
2011, 2015 Conference on Artificial Intelligence in Medicine (AIME)  
2018 AMIA Joint Summits on Translational Science

#### Extramural Grant Reviewing

2010 Medical Research Council, London, UK  
2012 University of Pittsburgh, Small Grants Program, Central Research Development Fund  
2011 – 2012 National Science Foundation, Smart Health and Wellbeing Review Panel  
2016 NIH Precision Medicine Review Meeting, Special Emphasis Panel ZTR1-SRC-99  
2016 National Science Foundation, External Reviewer for CISE Research Initiation Initiative (CRII)

#### Press

2012 Savage, N. Better Medicine Through Machine Learning. Communications of the ACM (Vol. 55 No. 1, January 2012)  
2012 Powerful new method to analyze genetic data. Science Daily (12 June 2012)  
<http://www.sciencedaily.com/releases/2012/06/120612115944.htm>  
2013 Miksch, J. A computer guy's take on personalized medicine. PittMed (Summer 2013)  
2016 Pitt Receives Prestigious NIH Award to Support Development of Million-Person Precision Medicine Study. University of Pittsburgh Health Sciences Media Relations.

### **CURRENT RESEARCH INTERESTS**

1. Application of artificial intelligence and machine learning to problems in the Learning Health System
2. Learning electronic medical record (EMR) system and computerized clinical decision support
3. Precision medicine and personalized modeling
4. Data mining and causal discovery from biomedical data
5. Reuse of EMR data and research data warehousing
6. Automated visual analytics



## SERVICE

### Department

- 2009 – present Member, Graduate Training Program in Biomedical Informatics Core Faculty
- 2009 – 2016 Associate Director, Graduate Training Program in Biomedical Informatics
- 2009 – 2016 Chair, Graduate Training Program Curriculum Committee
- 2009 – 2016 Member, Graduate Training Program Executive Leadership Committee
- 2009 – 2016 Member, Graduate Training Program Admissions Committee
- 2009 – 2016 Member, Graduate Training Program Student Evaluation Committee
- 2011 – present Member, Graduate Training Program Preliminary Examination Committee
- 2014 – present Director of Clinical Informatics
- 2015 – 2016 Co-Director, Biomedical Informatics Core, Clinical and Translational Science Institute
- 2016 – present Director, Biomedical Informatics Core, Clinical and Translational Science Institute
- 2016 – 2017 Director, Center for Clinical Research Informatics (CCRI)
- 2016 – 2017 Co-Director, Center for Clinical Informatics (CCI)
- 2016 – present Member, Strategic Planning Committee
- 2016 – 2017 Member, Faculty Search Advisory Committee
- 2017 – present Member, Graduate Training Program Curriculum Committee
- 2018 – present Director, Data Enabled Clinical Informatics Center (DECIC)

### University and School of Medicine

- 2008 – present Biomedical Informatics Program Director, Medical Scientist Training Program of the University of Pittsburgh School of Medicine
- 2008 – present Career Advisor, Medical Scientist Training Program of the University of Pittsburgh School of Medicine
- 2009 – present Member, University of Pittsburgh Graduate Faculty, University of Pittsburgh
- 2009 – present Member, Graduate Training Program in Intelligent Systems, University of Pittsburgh Dietrich School of Arts and Sciences
- 2009 – present Member, PhD in Clinical and Translational Science Program Committee, University of Pittsburgh School of Medicine (KL2 and TL1 programs)
- 2016 – present Member, Tenured Faculty Promotions and Appointments (TFPA) Committee, University of Pittsburgh School of Medicine
- 2016 – 2017 Member, Data Management Committee, University of Pittsburgh
- 2016 Member, Data-X Committee for the new School of Computing and Information (A Data- and Knowledge-Centric Initiative for Transformative Medicine and Healthcare)
- 2018 – present Mentor, Digestive Diseases Training Program, University of Pittsburgh School of Medicine (T32 program)

### External Advisory Boards and Panels

- 2014 – 2015 Member, External Advisory Board for the National Institute of Health Transformatomics, Jawaharlal Institute of Medicine and Surgery Post-Graduate Medical Education and Research (JIPMER), Pondicherry, India

## National Organizations

- 2008, 2012 Member, Workshop Committee, International Conference on Machine Learning (ICML) Workshop on Machine Learning for Health Care Applications
- 2011 Member, Workshop Committee, Artificial Intelligence in Medicine (AIME 2011) Workshop on Probabilistic Problem Solving in Biomedicine
- 2011 Member, Workshop Committee, International Conference on Machine Learning and Applications (ICMLA 2011) Workshop on Machine Learning in Medicine
- 2011, 2015 – 2016 Member, Program Committee, AMIA Summit on Translational Bioinformatics
- 2012 Track Chair, Program Committee, AMIA Summit on Translational Bioinformatics
- 2013 Member, Program Committee, The Twenty-Seventh AAAI Conference on Artificial Intelligence
- 2013 – 2014 Member, Workshop Committee, IEEE international conference on Bioinformatics and Biomedicine (BIBM) Workshop on Biomedical and Health Informatics (BHI)
- 2014 Member, Scientific Program Committee, AMIA Annual Symposium
- 2015 – present Member, Clinical Research Forum Annual Meeting, Clinical Research Forum, 2025 M Street NW, Suite 800 Washington DC 20036
- 2015 – 2017 Member, IT Roundtable Planning Committee, Clinical Research Forum, 2025 M Street NW, Suite 800 Washington DC 20036
- 2016 – 2017 Member, EHR Working Group, All of Us Research Program of the Precision Medicine Initiative (PMI)
- 2016 – 2017 Member, Data Privacy Working Group, All of Us Research Program of the Precision Medicine Initiative (PMI)
- 2017 – 2018 Member, Common Data Model Harmonization Committee, FDA's Center for Drug Evaluation and Research and IBM