Curriculum Vitae Mark Voortman

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Education

- Ph.D., Information Sciences, University of Pittsburgh, USA, May 2010.
- M.S., Media and Knowledge Engineering, Delft University of Technology, The Netherlands, August 2005.
- B.S., Technical Informatics, Delft University of Technology, The Netherlands, August 2005.

Teaching experience

- I believe that the most important aspect of teaching is to engage your students. Therefore, I do not subscribe to one particular teaching style but will apply different tools based on the content of the course and the level of the students. For example, in programming courses my main tool in class is to open up my editor and then show the students in front of their eyes how they should write their programs. This is a very effective way to teach programming habits and debugging skills.
- I co-created the new Information Technology Program at Point Park University and I am now responsible for its implementation (Fall 2015). The new program is aimed at equipping students with a strong technical skillset in order to be very attractive for employers in the job market.
- As Visiting Assistant Professor of Information Technology at Point Park University:
    - Undergraduate:
        - Databases.
        - Networking and Security.
        - Web Design and Development.
        - Introduction to Programming.
        - Intermediate Programming.
        - Object Oriented Systems Design and Analysis.
        - Server Management.
    - Graduate:
        - Database Management and Applications.
        - Special Topics in Management Information Systems: Business Analytics.
- Taught guest lectures in Decision Analysis and Decision Support Systems (graduate), and Research Design (graduate), Information Science, University of Pittsburgh.
- Teaching assistant at the School of Information Sciences, University of Pittsburgh:
    - Undergraduate:
        - Data Structures in C.
    - Graduate:
        - Decision Analysis and Decision Support Systems.
        - Data Mining.
        - Human Information Processing.

Technical skills

- 15+ years of programming experience.
- 15+ years of server administration.

- Deep understanding of all levels of the web development stack including, but not limited to:
  - Operating system administration: FreeBSD and other Unix derived systems, Windows.
  - Protocols: TCP/IP, HTTP, FTP, SSH, SSL.
  - Web standards: (X)HTML, XML, XSLT, CSS, ECMAScript, JSON.
  - Web servers: Tomcat, Apache.
  - Databases: PostgreSQL, MySQL, Oracle.
  - Programming and scripting languages: C, C++, JavaScript, Lisp (Scheme, Common Lisp), Java, Python, SQL, Matlab.

- Other software:
  - Former developer of GeNIe/SMILE (http://genie.sis.pitt.edu).
  - Emacs and Eclipse for coding.
  - Trac and Subversion for project management and bug tracking.
  - VirtualBox.
  - Weka.

- Implemented many (statistical) algorithms and extensive modeling experience.

Examples of skills

- In 2010 I founded my own company Voortman Technologies LLC that focuses on developing privacy-by-design services. Although currently I cannot work for it because of my visa status, the used technology is interesting:
  - Developed an in-house programming language that is a Lisp dialect (implemented using Continuation-Passing Style).
  - Developed an in-house web server.
  - Developed an in-house transactional database storage system that makes it possible to store any kind of data structure in the database without writing any additional code.
  - The purpose of developing these technologies is to simplify the web development stack. All components run in one singly binary thereby reducing overhead.
  - The developed technology is currently being used in a live site that allows customers to create and purchase their own custom made cardboard books.
  - This is my attempt at developing a solution to the complexity of web development, but I realize there are many excellent (open source) tools available and I've used many.

- While I was pursuing my doctoral degree at the Decision Systems Laboratory, University of Pittsburgh, I implemented and invented several sophisticated statistical learning algorithms. These algorithms can be used to learn (causal) models from data, fit parameters to these models, and finally use the models to make decisions in any domain.

Other skills

- Professional attitude and excellent communication skills.
- Eye for detail.
- Able to pick up new technologies quickly.
- Passion for technology and always looking for better ways to do things.

Research interests

- Causal discovery in dynamic systems.
- Probabilistic graphical models.
- Decision theory.
- Machine learning and data science.
- Artificial intelligence.

Research experience

- Post-doctoral researcher at Computer Science, University of Pittsburgh (March 2013 - March 2014). This involves three separate tasks:
    - Research in Immunity Inspired Security.
    - Setting up a collaborative research infrastructure for a new center for developing Immunity Inspired Research.
    - Organizing workshops.

- Post-doctoral researcher at the Graduate School of Public and International Affairs, University of Pittsburgh (June 2012 - February 2013). Worked on several different projects, all involved modeling using Bayesian Networks:
    - Tsunami detection in Indonesia by placing bottom pressure sensors in the ocean to ensure a timely evacuation. This involved writing a simulation in C for the arrival time of the wave and communication between the sensors. The results were plotted on a GIS map.
    - Decision support for emergency managers, as part of a NSF I-Corps grant to explore the commercial viability of the JIISIS software. Bayesian networks would enable emergency mangers to make better and faster decisions.

Employment history

- April 2014 – Present: Visiting Assistant Professor at Point Park University. As professor of IT I teach many technical courses and am also responsible for developing a new curriculum that will be implemented in the Fall of 2015.

- March 2013 – March 2014: Postdoctoral research in Computer Science at the University of Pittsburgh on Immunity Inspired Security. Besides publishing also responsible for setting up a collaborative research infrastructure for a new center that uses ideas from the human immune system to implement more secure information systems.

- June 2012 – February 2013: Postdoctoral researcher at the Center for Disaster Management, GSPIA, University of Pittsburgh. Responsible for eliciting knowledge from disaster managers

and capturing this in Bayesian networks and influence diagrams. Also provide a front-end user interface mostly written in Javascript, and the server side implementation was written in Java.

- January 2011 – May 2012: Consultant at the Center for Disaster Management, GSPIA, University of Pittsburgh. Developed several prototypes that can be used for sociotechnical systems and disaster management. Contributed to the development of JIISIS, or Java Interactive, Intelligent, Spatial Information System.

- April 2010 – May 2012: Founder of Voortman Technologies LLC. The company focuses on developing privacy-by-design services. It also develops third-party websites by utilizing an in-house developed framework. For this, I developed my own tools in the form of a programming language, which is a Lisp dialect and implemented in C using Continuation-Passing Style, a web server mostly written in C, and a transactional database storage system that makes it possible to store any kind of data structure in the database without writing any additional code. The developed technology is currently being used in a live site that allows customers to create and purchase their own custom made cardboard books.

- August 2005 – December 2009: Ph.D. student in the Decision Systems Laboratory, University of Pittsburgh. Developer of GeNIe/SMILE (http://genie.sis.pitt.edu) that is written in C++ and maintainer of the webserver and websites. I implemented and invented several sophisticated statistical learning algorithms. These algorithms can be used to learn (causal) models from data, fit parameters to these models, and finally use the models to make decisions in any domain.

- November 2004 – August 2005: Visiting scholar at the Decision Systems Laboratory, University of Pittsburgh. Research project on using cases to refine Bayesian networks.

- May 2003 – August 2004: Internship at Diginext, a company that develops products for mobile phone Internet access. My task was to design and implement a time registration system for internal usage.

- January 2002 – January 2007: Co-founder of a startup that specialized in IT services, mainly building websites.

Publications

- Denver Dash, Mark Voortman, and Martijn de Jongh, "Sequences of Mechanisms for Causal Reasoning in Artificial Intelligence," 23rd International Joint Conference on Artificial Intelligence, August 2013.

- Louise K. Comfort, Clayton Wukich, Brian Colella, Mark Voortman, Scott Connelly, Jill L. Drury, and Gary L. Klein, "Real-time Decision Making in Urgent Events: Modeling Options for Action," Proceedings of the 10th International ISCRAM Conference – Baden-Baden, Germany, May 2013.

- L. K. Comfort, T. Znati, M. Voortman,, Xerandy, and L. E. Freitag, "Early Detection of Near-Field Tsunamis Using Underwater Sensor Networks," 5th International Tsunami Society Conference, September 2012.

- Denver Dash and Mark Voortman, "Toward a New Representation for Causation in Dynamic Systems," 25th Annual Conference on Neural Information Processing Systems Workshop, December 2011.

- Mark Voortman and Denver Dash, "Learning Dynamic Models With Latent Confounding Processes," 24th Annual Conference on Neural Information Processing Systems Workshop, December 2010.

- Mark Voortman, Denver Dash, and Marek J. Druzdzel, "Learning Why Things Change: The Difference-Based Causality Learner," 26th Conference on Uncertainty in Artificial Intelligence, July 2010.

- Ph.D. Dissertation: "Causal Discovery of Dynamic Systems," December 2009.

- Mark Voortman, Denver Dash, Marek J. Druzdzel, Dean Pomerleau, and Gustavo Sudre, "Difference-Based Causal Models: Bridging the gap between Granger causality and DCMs," 23rd Annual Conference on Neural Information Processing Systems Workshop, December 2009.

- Mark Voortman, Denver Dash, and Marek J. Druzdzel, "Learning Causal Models That Make Correct Manipulation Predictions With Time Series Data," 22nd Annual Conference on Neural Information Processing Systems Workshop, December 2008.

- Mark Voortman and Marek J. Druzdzel, "Insensitivity of Constraint-Based Causal Discovery Algorithms to Violations of the Assumption of Multivariate Normality," 21st International Florida Artificial Intelligence Research Society Conference, May 2008.

- Adam Zagorecki, Mark Voortman, and Marek J. Druzdzel, "Decomposing Local Probability Distributions in Bayesian Networks for Improved Inference and Parameter Learning," 19th International Florida Artificial Intelligence Research Society Conference, May 2006.

Awards

- First place award in the i-Fest 2009 poster competition for the poster "Learning Dynamic Causal Models" in the School of Information Sciences.

- Winner of the 2009 Robert R. Korfhage Award in recognition of excellence in writing a scholarly paper on information retrieval or a related topic by a student in collaboration with a faculty member. School of Information Sciences, University of Pittsburgh.

- Winner of the 2006 Catherine Ofiesh Orner Award in recognition of excellence in writing a scholarly paper in information science. School of Information Sciences, University of Pittsburgh.