Faculty Name: Emmanuel Agu

Home Page: http://www.cs.wpi.edu/~emmanuel/

Research Group Memberships: MGRG, ISRG, PEDS

Graduate Courses Taught: CS 543, CS 563, CS 525M (Ubiquitous and Mobile Computing)


Research Description:

Professor Emmanuel Agu has done research in mobile and ubiquitous computing for over fifteen years. He has researched and developed several mobile applications including location-aware tour guides, location-aware security modules, and a mobile and distributed graphics framework (MADGRAF). Since 2011, he has done mobile health research including an NSF funded project to develop a mobile application for patients with advanced diabetes, which automatically analyzes the healing progress of their foot ulcers and helps them manage their condition at home.

In computer graphics, he has researched how to render natural effects such as diffraction in CD roms, interference in butterfly wings and dispersive refraction in diamonds and prisms. He also investigates how to reduce the battery consumption of graphics algorithms on mobile devices and efficient display on small screens. Finally, he researches how to use graphics processors (GPUs) to speed up compute-intensive algorithms such as radar algorithms and financial applications.

Current Graduate Research Students: Qian He, William DiSanto, Che Sun

Representative Publications:

Characterizing the Performance and Behaviors of Runners using Twitter Qian He, Emmanuel Agu, Peder Pederson, Diane Strong and Bengisu Tulu in Proc IEEE International Conference on Healthcare Informatics (ICHI) 2013, Philadelphia, PA


Real-Time Dispersive Refraction with Adaptive Spectral Mapping Damon Blanchette and Emmanuel Agu, International Journal on Artificial Intelligence Tools

Faculty Name: Joseph Beck

Home page: http://www.wpi.edu/~josephbeck

Research Group Memberships: AIRG, TRG

Graduate Courses Taught: CS 534, CS 525 (Empirical Methods for Human Centered Computing), CS 525 (Graphical Models for Reasoning under Uncertainty)

Research Topics: educational data mining, machine learning and data mining, Bayesian inference, graphical modeling, causal modeling, empirical methods, evaluation, intelligent tutoring systems, human learning, assessment, AI

Research Description:

In a nutshell, my research is to do for our understanding of human learning what bioinformatics has done to our understanding of fine-grained biological processes. The enabling technologies for this endeavor, educational data mining, are more students using educational software, and computer networks becoming fast enough to send all student data back to a central repository. Having access to learning data from thousands of students across an entire school year is a powerful resource. The challenge is to develop computational approaches to make sense of the data, to raise new interesting questions, and to answer them. For example, when a student asks a computer for help on the current item, the help certainly helps him get through the current problem, but does it actually lead to longer-term learning? Answering this simple-sounding question is surprisingly subtle, and several naive models will not work. Therefore, I developed and trained a Dynamic Bayesian Network model that estimates both the short- and long-term effects of students asking for help. I work on a variety of problems related to human learning, and am also interested in using causal models more generally.

Current Graduate Research Students: Xiaolu Xiong, Hao Wan, Supreeth Gowda, Dovan Rai.

Representative Publications:


Faculty Name: Dmitry Berenson

Home Page: http://web.cs.wpi.edu/~dberenson/

Research Group Memberships: Artificial Intelligence, Human-Robot Interaction

Graduate Courses Taught: CS 525 - Motion Planning, CS 534 - Artificial Intelligence (starting Fall 2013)

Research Topics: planning algorithms, artificial intelligence, robotic manipulation, human-robot collaboration

Research Description: My research focuses on creating algorithms that allow robots to interact with the world and collaborate efficiently with people. These general-purpose motion planning and manipulation algorithms can be applied to robots that work in homes, factories, and operating rooms. I am interested in all aspects of algorithm development; including creating efficient algorithms, proving their theoretical properties, validating them on real-world robots and problems, integrating them with sensing and higher-level reasoning, and distributing them to open-source communities. Our lab draws on ideas in search, optimization, control theory, and topology to develop these planning algorithms and to prove their properties. We also seek to develop algorithms which can generalize to many types of practical tasks and application areas.

Current Graduate Research Students: Artem Gritsenko, Calder Phillips-Grafflin, Jim Mainprice (post-doc)

Representative Publications:


Faculty Name: Dave Brown

Home Page: http://web.cs.wpi.edu/~dcb/

Research Group Memberships: AIRG, AIDG

Graduate Courses Taught: CS 538, CS 540

Research Topics: AI in Design, Computational Creativity, Design Rationale, Intelligent Interfaces, AI

Research Description:
Research interests include computational models of engineering design, and the applications of Artificial Intelligence to engineering, manufacturing, and interfaces. Current focus is on computational creative design, and models of surprise and novelty.

Current Graduate Research Students: –

Representative Publications:


Special Roles: 2001-2011: Editor in Chief of the AI EDAM journal, Cambridge UP.
Faculty Name: Sonia Chernova

Home Page: http://www.wpi.edu/~soniac

Research Group Memberships: Robot Autonomy and Interactive Learning (RAIL), Human-Robot Interaction (HRI) reading group

Graduate Courses Taught: CS-595 Human-Robot Interaction

Research Topics: crowdsourcing, interactive robot learning, adjustable autonomy, multi-robot systems, human-robot interaction

Research Description:

My research interests lie in interactive robot learning, adjustable autonomy and human-robot interaction, and my work focuses on the development algorithms that enable robots to learn through social interaction with humans. I am particularly interested in active learning and the development of algorithms that enable learning agents to regulate their autonomy and request help from a human at critical timepoints. I am also interested in exploring online crowdsourcing as a means for training social robots, with the goal of developing robots capable of natural interaction and adaptation based on observation of human behavior.

Current Graduate Research Students: Bener Suay, Russell Toris, Adrian Boteanu, Anahita Mohseni Kabir, Daniel Miller, David Kent,

Representative Publications:


Sonia Chernova, Nicholas DePalma and Cynthia Breazeal. Crowdsourcing Human-Robot Interaction: Application from Virtual to Physical Worlds. In the IEEE International Symposium on Robot and Human Interactive Communication (Ro-Man), 2011.


Faculty Name: Mark Claypool

Home Page: http://www.cs.wpi.edu/~claypool/

Research Group Memberships: PEDS, CC

Graduate Courses Taught: CS 502, CS 529, CS 533

Research Topics: Multimedia Networks, Network Performance Analysis

Research Description:

Studying the effects of latency on interactive, Internet applications (such as streaming video or online games) is a core research problem my group tackles. The effects of other systems settings, such as frame rate, frame resolution and graphics settings, on Internet applications is also quite interesting. My general approach to computer science research is based upon a solid experimental research methodology: Observe, Hypothesize, Design, Experiment, Analyze and Report. My overall research interests include multimedia networking, congestion control, and network games.

Current Graduate Research Students: Meng Luo, Zhe Zhou

Representative Publications:


Faculty Name: Dan Dougherty

Home Page: http://web.cs.wpi.edu/~dd/

Research Group Memberships: ALAS

Graduate Courses Taught: CS 5003, CS 503, CS 521, CS 559

Research Topics: Logic in Computer Science generally, with a focus on security, verification, and automated deduction.

Research Description:

The ALAS lab explores various problems related to logic, software engineering, software verification, security, and programming languages. We write formal models to make sense of computing problems, figure out how to describe complex system behaviors in useful ways as programs and for human end users, and build software tools that make programs more reliable and secure.

Current Graduate Research Students: Salman Saghafi, Ryan Danas

Representative Publications:

(see http://web.cs.wpi.edu/ dd/publications for abstracts and links to these and other papers)


Faculty Name: Mohamed Y. Eltabakh

Home Page: http://web.cs.wpi.edu/~meltabakh/MohammedEltabakh.html

Research Group Memberships: DSRG

Graduate Courses Taught: CS 525 Large Scale Data Management, CS 561 Advanced Topics in Database Systems

Research Topics: Database Management Systems, Information Management, Query Processing and Optimization, Indexing Techniques, Scientific Data Management, Large-scale Data Analytics.

Research Description:

My research is in the broad area of Database Management Systems and Information Management. In particular, I work in the areas of query processing and optimization, indexing techniques, scientific data management, and large-scale data analytics. My recent work has explored extending Hadoop infrastructure to support complex operations such as joins and aggregations efficiently on large-scale datasets. Currently, I am exploring possible extensions to both database management systems and Hadoop framework to support scientific applications and health-care systems.

Current Graduate Research Students: Dongqing Xiao

Representative Publications:


**Faculty Name:** Kathi Fisler

**Home Page:** [http://www.cs.wpi.edu/~kfisler/](http://www.cs.wpi.edu/~kfisler/)

**Research Group Memberships:** ALAS

**Graduate Courses Taught:** CS 536

**Research Topics:** Formal verification, Software security, Programming Pedagogy

**Research Description:**

Modern computing systems are too complex for humans to comprehend in their entirety. This applies both to computing experts designing systems to manage critical infrastructure and to mainstream end-users configuring web-applications and ubiquitous computing devices. How do we create reliable computing artifacts from incorrect, incomplete and often inconsistent information from people? My research explores several corners of this question, including designing authoring tools for access-control and firewall policies, extracting formal system models from informal specifications, and teaching programming to novices.

**Current Graduate Research Students:** Salman Saghafi

**Representative Publications:**


Faculty Name: Mike Gennert

Home Page: http://web.cs.wpi.edu/~michaelg/

Research Group Memberships: ISRG

Graduate Courses Taught: CS/ECE 545 Digital Image Processing, CS/RBE 549 Computer Vision

Research Topics: Robotics, Image Processing, Computer Vision

Research Description:

My main research interests are Robotics, Computer Vision, and Image Processing. In robotics, I am interested in developing novel types of robots, for example, to inspect trees for insect infestation and to bury power and telephone lines. Specific robotics research problems include climbing robots and robot navigation. In CV/IP, my students and I work on methods to correct for patient motion to produce the best possible images. Other research problems involve camera calibration for motion correction, motion tracking, and human models.

Current Graduate Research Students: Benzun Pious Wisely Babu

Current Post-Doctoral Researcher: Cliff Lindsay


Special Roles: Director of Robotics Engineering, former CS Department Head
Faculty Name: Joshua Guttman

Home Page: http://web.cs.wpi.edu/~guttman/

Research Group Memberships: ALAS: Applied Logic and Security

Graduate Courses Taught: CS 521, 557

Research Topics: Information security and its foundations, Logical foundations of CS, Programming Languages.

Research Description:

My active research interests concern the foundations of trust and security in distributed systems. In particular, I am working on methods to design and verify security protocols; on logical techniques for reasoning about the behavior of secure systems; and on methods to design systems in which the security of the system survives despite the compromise of subsets of its components.

Current Graduate Research Students:

Representative Publications:


Faculty Name: Neil Heffernan

Home Page: http://web.cs.wpi.edu/~nth/

Research Group Memberships: AIRG, TRG

Graduate Courses Taught: CS 525 (Intelligent Tutoring Systems)

Research Topics: Artificial Intelligence

Research Description:

The Artificial Intelligence work that I do mainly focuses on Educational Data Mining where we use techniques such as Bayesian networks and regression trees to better predict student data within Intelligent Tutoring Systems. I get very excited working with graduate students on projects related to ASSISTments. ASSISTments is a web-based tutoring system used by 7,000 students and about 100 teachers in Massachusetts and a few other states. Students that work on projects with ASSISTments will definitely have an impact on a large number of elementary and secondary school students. We do exciting work in software engineering and Educational Data Mining. We recently started work on an innovative new model that uses Bayesian Networks to better predict student learning.

Current Graduate Research Students: Kim Kelly, Solomon Nyame, Korinn Ostrow, Douglas Selent, Yue Gong, Yutao Wang, Christopher Donnelly, Siyuan Zhao, Yan Wang, Seth Adjei.

Representative Publications:


Faculty Name: George Heineman

Home Page: http://www.cs.wpi.edu/~heineman

Research Group Memberships: SERG

Graduate Courses Taught: CS 509, CS 562, CS 525 (Software Composition)

Research Topics: Software Engineering, Component technology, Service Oriented Architecture

Research Description:
My research focuses on models and techniques to improve the ability to compose and decompose large software systems from modular units. Software component technology has evolved dramatically over the past decade and a number of viable component models (e.g., OSGi, EJB) have been developed and are currently in use within industry. In many ways, these technologies have only solved the syntactic problem of how to connect software units together. More challenging is the semantic composition of software units to ensure specific behaviors and functionalities. To address the fundamental issues in this space, I investigate a number of modular technologies including: Aspect oriented programming (AOP), Feature oriented programming (FOP), object oriented programming (OOP).

Current Graduate Research Students:

Representative Publications:


George Heineman, Gary Pollice, Stanley Selkow, Algorithms in a Nutshell, October 2008

Faculty Name: Micha Hofri

Home Page: http://www.cs.wpi.edu/~hofri

Research Group Memberships: THUG

Graduate Courses Taught: CS 5084, CS 584, CS 504

Research Topics: Analysis of algorithms, probabilistic processes, applied analysis and combinatorics.

Research Description: My research includes the analysis of algorithms that can operate on data in storage, such as sorting and the generation of data structures, algorithms that control processes, such as communications protocols and managing wireless sensors networks, or methods of scheduling in operating systems. The main interest is the underlying processes, which are usually stochastic (probabilistic), and finding information about their properties. The tools are taken from probability, combinatorics (including complex analysis) and uses calculations (also with computer aids such as Maple), and simulations.

Current Graduate Research Students:

Representative Publications:


Faculty Name: Robert Kinicki

Home Page: http://web.cs.wpi.edu/~rek/

Research Group Memberships: PEDS, CC

Graduate Courses Taught: CS 513, CS 577

Research Topics: Wireless Sensor Networks including Body Area Networks, Wireless Networks, The Internet of Things

Research Description:

Wireless sensor networks (WSNs) have emerged as a critical technology for the development of smart technologies and in continuous monitoring of environmental, medical, structural and surveillance applications. As a subset of wireless networks, WSNs must be designed to be power-aware to extend the network lifetime. Recent research efforts involve analysis and design of power-aware MAC protocols for WSNs. Wireless network research includes IEEE 802.11 networks, cellular network technologies and Zigbee. My recent research has focused on power-aware issues and the new IPv6 stack associated with Contiki.

Current Graduate Research Students: Zhe Zhou

Representative Publications:


Faculty Name: Xiangnan Kong

Home Page:  http://web.cs.wpi.edu/~xkong/

Research Group Memberships:

Graduate Courses Taught:

Research Topics: Data Mining and Big Data Analysis

Research Description: My research interests are in data mining and big data analysis, with emphasis on addressing the data variety issues in biomedical research and social computing. I serve as the information director and information specialist of ACM Transactions on Knowledge Discovery from Data. I am a co-founder of ScissorsFly.com, which is developing web clipping techniques for the online information management.

Current Graduate Research Students:

Representative Publications:

Xiangnan Kong, Zhaoming Wu, Li-Jia Li, Ruofei Zhang, Philip S. Yu, Hang Wu and Wei Fan. “Large-Scale Multi-Label Learning with Incomplete Label Assignments.” SIAM International Conference on Data Mining (SDM), 2014

Ning Yang, Xiangnan Kong, Fengjiao Wang, and Philip S. Yu. “When and Where: Predicting Human Movements Based on Social Spatial-Temporal Events.” SIAM International Conference on Data Mining (SDM), 2014


Jiawei Zhang, Xiangnan Kong, and Philip S. Yu. “Transferring Heterogeneous Links across Location-Based Social Networks.” ACM International Conference on Web Search and Data Mining (WSDM), 2014

Chun-Ta Lu, Sihong Xie, Xiangnan Kong, and Philip S. Yu. “Inferring the Impacts of Social Media on Crowdfunding.” ACM International Conference on Web Search and Data Mining (WSDM), 2014
Faculty Name: Dmitry Korkin

Home Page: http://web.cs.wpi.edu/~dkorkine/

Research Group Memberships:

Graduate Courses Taught:

Research Topics: bioinformatics, machine learning and data mining, and computational genomics

Research Description: My areas of research include bioinformatics, machine learning and data mining, and computational genomics. My recent awards include 2009 National Science Foundation CAREER Award and 2013 Junior Research Faculty of the Year Award.

Current Graduate Research Students: Andi Dhroso, Hongzhu Cui, Nathan Johnson (BBT)

Representative Publications:


Faculty Name: Rob Lindeman

Home Page: http://web.cs.wpi.edu/~gogo/

Research Group Memberships: HIVE, ISRG, MGRG

Graduate Courses Taught: CS 525H (Human-Computer Interaction in Immersive Environments), CS 525V (Building Effective Virtual Worlds), CS 525U (3D User Interaction), CS 543

Research Topics: Virtual Reality, Game Development, 3D User Interaction, User Studies, Computer Graphics

Research Description:

Virtual environments are systems that represent a space using computer-generated or mediated stimuli. While this definition might seem broad, the defining differences between similar systems (e.g., desktop simulations) are a high level of immersion (i.e., "being there") combined with a tight coupling between user actions and changes to the environment. This reliance on effective user interaction, in all its forms, is the main goal of the WPI HIVE. We define virtual reality (VR) as fooling the senses into believing they are experiencing something that they are not actually experiencing. For our group, it is important to address all the senses. The vast majority of work that has been done in the field of VR has addressed the visual and auditory senses. We are interested in the remaining senses, haptic, olfactory, and gustatory, in addition to these.

Current Graduate Research Students: Mi Feng, Jia Wang, Zhixin Yan.

Representative Publications:


Faculty Name: Charles Rich

Home Page: http://www.cs.wpi.edu/~rich

Research Group Memberships: Human-Robot Interaction, Artificial Intelligence

Graduate Courses Taught: CS 525 (Intelligent User Interfaces),

Research Topics: artificial intelligence, interactive media and game development, intelligent user interfaces, human robot interaction

Research Description:

When you collaborate with another human, your interaction consists not only of what you say (verbal behavior), but also how you move your body (nonverbal behavior). This intricately timed physical dance has tacit rules regarding, for example, where you look, when you nod your head, how you gesture with your hands, how you orient your body, and how long you wait for a response. A robot that does not correctly follow these nonverbal interaction rules will be difficult to work with.

We are using a specially constructed humanoid robot, named Melvin, to investigate these human-robot interaction rules. Melvin has a moveable head, arms and an expressive face, and is mounted on a two-wheeled mobile base. A speaker, microphone array and stereo camera let him talk, hear and see. Melvin is connected to several computers that run various kinds of artificial intelligence software, including programs for computer vision, natural language and speech understanding and generation, planning and dialogue modeling. Together, these programs support his totally autonomous interaction with humans.

Current Graduate Research Students: Anahita Mohseni Kabir, Mohammad Shayganfar

Representative Publications:


Faculty Name: Carolina Ruiz

Home Page: http://web.cs.wpi.edu/~ruiz/

Research Group Memberships: KDDRG, AIRG

Graduate Courses Taught: CS 548, CS 539, CS 534, CS 583 / BCB 503 (Bioinfo & Biomedical Database Mining)

Research Topics: Data Mining, Machine Learning, Bioinformatics, Biomedical Data Analysis, Knowledge Discovery in Databases

Research Description:

Professor Ruiz’s research focuses on algorithms for the discovery of patterns in data, with applications to several domains including bioinformatics and clinical medicine.

Current Graduate Research Students: Chiying Wang, Ahmedul Kabir.

Representative Publications:


**Faculty Name:** Elke Rundensteiner

**Home Page:** http://web.cs.wpi.edu/~rundenst

**Research Groups:** DSRG, XMDV

**Courses Taught:** CS542, CS561, CS525b (Big Data Analytics) CS525s (Data Streams),

**Research Topics:** Data and Information Management, Big Data Analytics, High-performance Stream Systems.

**Research Description:**

My research projects center around the development of scalable data management and mining technology in support of advanced applications including business, engineering, and sciences. Current research projects include intelligent event analytics, scalable big data infrastructures, stream mining and discovery, stream processing, visual information exploration, and health care data management. My event analytics project focusses on the development of innovative event stream processing and analysis techniques to extract actionable knowledge out of continuous streams of raw data at the speed of thought. In a related project, we apply this cutting-edge event analytics technology over RFID data streams to track healthcare workers within a hospital setting to prevent the spread of infections.

**Current Graduate Research Students:** Qingyang Wang, Zhongfang Zhuang, Maryam Hasan, Rodica Neamtu, Lei Cao, Chuan Lei, Olga Poppe, Xiao Qin, Medhabi Ray, Xika Lin, Salah Ahmed.

**Representative Publications:**


**Special Role:** CS Graduate and Research Coordinator
Faculty Name: Gabor Sarkozy

Home Page: http://web.cs.wpi.edu/~gsarkozy/

Research Group Memberships: THUG

Graduate Courses Taught: CS 584, CS 5084

Research Topics: Graph Theory, Discrete Mathematics, Theoretical Computer Science

Research Description:
Most of my research is in graph theory. This field has connections to many classical mathematical fields, such as topology, algebra, matrix theory and even number theory, but it also has many applications in computing, such as in data representations and network computing. In particular I am interested in finding “order in chaos”, or finding regular substructures in very large graphs and then applying these. Based on these ideas we developed a new clustering method, that we called Regularity clustering.

Current Graduate Research Students:

Representative Publications:


Faculty Name: Stanley Selkow

Home Page: http://web.cs.wpi.edu/~sms/

Research Group Memberships: THUG

Graduate Courses Taught: CS 584, CS 503

Research Topics: Graph Theory, Algorithmics

Research Description:
Most of my research is in Graph Theory, and in particular in Extremal Graph Theory and in Ramsey Theory.

Current Graduate Research Student:

Representative Publications:

A. Gyarfas, G. N. Sarkozy, A. Sebo, and S. Selkow, "Ramsey-type results for Gallai colorings", Journal of Graph Theory, 2009

George Heineman, Gary Pollice and Stanley Selkow, Algorithms in a Nutshell, O'Reilly, 2008

Faculty Name: Craig Shue

Home Page: http://web.cs.wpi.edu/~cshue

Research Group Memberships: ALAS, PEDS

Graduate Courses Taught: CS 525N: Network Security


Research Description:
My main research interests lie in the intersection of computer networking and security. My latest work has been in preventing online attacks, such as phishing and SQL injection attacks, using network-based approaches. I have also performed Internet measurement studies to examine how Web and DNS servers are provisioned and what vulnerabilities may result. I am particularly interested in studying network and security topics that are likely to make a substantial contribution to the lives of typical Internet users.

Current Graduate Research Students: Curtis Taylor, Doran Smestad, Marc Green, Douglas MacFarland.

Representative Publications:


Faculty Name: Candace L. Sidner

Home Page: http://www.cs.wpi.edu/~sidner

Research Group Memberships: Human-Robot Interaction, Artificial Intelligence

Research Topics: artificial intelligence, computational linguistics, intelligent user interfaces, human robot interaction, natural language processing

Research Description:

What should your robot do when it is not busy obeying your commands?

With the rapid drive of technology towards placing increasingly capable robots into human home, work and play environments, it is time to start asking this question. Obviously the answer depends a lot on what kind of robot we are talking about. For example, if it’s a turtle-like floor cleaning robot, it probably should wait silently out of sight until it’s time to clean the floor. But how about a humanoid household robot? According to some science fiction visions of the future, even such robots should stand silently at attention until commanded to do something.

Our answer is that a successful robot should spend its time building and maintaining long-term social relationships with the humans in its environment. Because humans are deeply and fundamentally social beings, they cannot help but expect a continuously present artificial being, especially if humanoid, to become part of their network of relationships. We are developing the underlying theory and software architecture to build relational agents (both robotic and virtual) for social support of older adults.

Current Graduate Students: Mohammad Shayganfar (joint with Prof. Rich), Anahita Mohseni (joint with Profs. Rich and Chernova)

Representative Publications:


Faculty Name: Krishna Venkatasubramanian

Home Page: http://web.cs.wpi.edu/~kven/

Research Groups: ALAS, PEDS

Courses Taught: CS 3516, CS 4401, CS 513, CS 525C (Cyber-Physical Systems).

Research Topics: medical cyber-physical systems, system security, and trust management

Research Description:

My research interests are primarily in the field of medical cyber-physical systems and their security. My specific focus is on enabling safe medical device interoperability, which is the next big revolution in designing medical device systems. The goal is to make disparate medical devices from diverse manufacturers to work together to provide a unified care system for a patient. In this regard, I am working on developing secure architectures for making existing medical devices interoperable with one another in a secure manner thus satisfying an important requirement to make them safe. In addition, I am also working on building secure next generation medical monitoring systems in the form of body area networks (a network of wearable health monitoring sensors). My goal is to design security solutions that are transparent to the users by making use of physiological features and models from the human body for security. I am also interested in exploring other domains in cyber-physical systems (e.g., vehicular networks, networked control systems), along with sensor networks, and system security.

Current Graduate Research Students: Hang Cai, Jian Xu

Representative Publications:


Faculty Name: Matthew Ward

Home Page: http://web.cs.wpi.edu/~matt

Research Groups: ISRG, Xmdv

Courses Taught: CS 543, CS 563, CS 549, CS 525D (Data Visualization), CS 582 (Biovisualization).

Research Topics: data and information visualization, visual analytics

Research Description:
I am interested in the graphical representation and interactive exploration and analysis of virtually any kind of data and information. You could call this visual data mining - you design mappings from the data fields to graphical entities and attributes, and then using interactions to navigate the data space, filter out uninteresting things, and drill down to the details. Our current research focuses on two major problems. The first is the visual analysis of continuously arriving (streaming) data, which is becoming common in an increasing number of application domains. Some of the challenges include identifying interesting patterns on the fly and shedding older data in a way that preserves the most interesting features. The second is the visual representation and management of discoveries made during the analysis process, either via computational or interactive visual means. Thus, one could refine or filter similar patterns or discoveries made via different processes, or organize the discoveries in a sequence that can be used to validate or refute a hypothesis.

Current Graduate Research Students: Kaiyu Zhao, Jack Bernard


Faculty Name: Craig Wills

Home Page: http://www.cs.wpi.edu/~cew

Research Group Memberships: PEDS

Graduate Courses Taught: CS 502, CS 513, CS 535

Research Topics: Web Privacy, Internet Performance, Network Measurement

Research Description:

My research involves systems and networks oriented work. I have three primary directions of current work. First is Web privacy where we seek to measure and understand privacy leakage on the Web while investigating techniques to prevent it. Second is home network measurement where we examine home network performance by using JavaScript/Flash and Java applets to reduce impediments and increase incentives for helping a user better understand “How’s My Network”. Finally, is work on a “utility provider” model that targets service-oriented computing. Our overriding goal is to gain understanding of basic principles in designing and building a global utility computing platform that would be highly responsive in resource reallocation, provide resource isolation to different applications, and support heterogeneous execution environments.

Current Graduate Research Students: Wei Zhang

Representative Publications:


Special Role: Computer Science Department Head