Robert S. Pienta

Researcher, Data Scientist

Georgia Institute of Technology, 266 Ferst Drive, Atlanta, GA 30332 U.S.A.
https://www.cc.gatech.edu/~rpienta3/
https://github.com/Saganaut
pientars@gatech.edu
LinkedIn

Summary

My research blends methods, techniques, and principles from visual analytics and data mining to create new, interactive, scalable tools that empower analysts when exploring, querying, and analyzing large networks.

Education

Aug. 2017 — Aug. 2011 **Ph.D. in Computational Science and Engineering**
Georgia Institute of Technology, Atlanta, GA
Thesis "Adaptive Visual Network Analytics: Algorithms, Interfaces, and Systems for Exploration and Querying"
Advisor Duen Horng (Polo) Chau

May 2011 — Aug. 2007 **B.S. Computer Science**
B.S. Mathematics
Rose-Hulman Institute of Technology, Terre Haute, IN

Research Experience

Summer 2016 **Pindrop Security**, *Atlanta, GA*
Research Intern (Ph.D.)
Developed techniques to collect, measure, and chart the landscape of fraud in the telephony channel. Created a visual analytics system to track the changes in telephone scams.
Principal Investigator: Terry Nelms

Summer 2015 **Pindrop Security**, *Atlanta, GA*
Research Intern (Ph.D.)
Leveraged large heterogeneous data to supplement machine learning methods which improved the quality of fraud detection and prediction. Prototyped a visual-analytics system

to flag suspicious call behavior as it occurs.
Principal Investigator: David Dewey

Summer 2014 **Google**, *Mountain View, CA*
Ph.D. Software Engineering Intern
Improving Ad-Quality Filtering - Designed and implemented a series of entropy-based filters to improve the quality of matched ads.
Mentor: Esteban Real

Fall 2013 **LogicBlox**, *Atlanta, GA*
Ph.D. Intern
Tested and compared high performance tuple-matching queries on a custom database management system against industry competitors. *Mentor: Molham Aref*

Summer 2013 **Google**, *Mountain View, CA*
Ph.D. Software Engineering Intern
Visually Discerning Predictive-Model Performance - Designed methods and visualizations to help engineers interactively compare and contrast predictive-model performance.
Mentor: Yanli Cai

Summer 2010 **University of Houston**, *Houston, TX — Computational Physiology Laboratory*
Ph.D. Software Engineering Intern
Designed and dveloped facial recognition algorithms in the thermal domain. Approach utilized a physiological taxonomy of facial expressions based on underlying musculature.
Principal Investigator: Ioannis Pavlidis

Summer 2009 **University of Iowa**, *Iowa City, IA*
Software Engineer

2009–2010 **Eli Lilly and Company**, *Terre Haute, IN*
Software Engineer Intern

Honors & Awards

2017 **Best Demo**, Honorable Mention at ACM SIGMOD/PODS Conference
2015–2017 **FLAMEL Fellowship**, National Science Foundation IGERT Fellowship
2011-2015 **President's Fellowship**, Georgia Institute of Technology
2010 **Best Poster**, Computational Science and Cybersecurity, University of Houston
2007–2011 **Dean's List**, Rose-Hulman Institute of Technology

Publications

VIGOR: Interactive Visual Exploration of Graph Query Results. Robert Pienta, Fred Hohman, Alex Endert, Acar Tamersoy, Kevin Roundy, Chris Gates, Shamkant Navathe, Duen Horng (Polo) Chau. IEEE Transactions on Visualization and Computer Graphics (Proc.

VAST'17), Jan 2018. [TVCG Journal – 21% acceptance rate]

Visual Graph Query Construction and Refinement. [Best Demo: Honorable Mention] **Robert Pienta**, Fred Hohman, Acar Tamersoy, Alex Endert, Shamkant Navathe, Hanghang Tong, and Duen Horng (Polo) Chau. In Proceedings of the 2017 ACM International Conference on Management of Data, of SIGMOD '17, pages 1587–1590, 2017.

Carina: Interactive Million-Node Graph Visualization using Web Browser Technologies. Dezhi (Andy) Fang, Matthew Keezer, Jacob Williams, Kshitij Kulkarni, **Robert Pienta**, Duen Horng (Polo) Chau. 26th International World Wide Web Conference (WWW) 2017 Companion. April 3-7, 2017. Perth, Australia.

Facets: Adaptive Local Exploration of Large Graphs. **Robert Pienta**, Minsuk (Brian) Kahng, Zhiyuan Lin, Jilles Vreeken, Partha Talukdar, James Abello, Ganesh Parameswaran, Duen Horng (Polo) Chau. SIAM International Conference on Data Mining (SDM) 2017. April 27-29, 2017. Houston, Texas.

Uncovering the Landscape of Fraud and Spam in the Telephony Channel. Aude Marzuoli, Hassan Kingravi, David Dewey, and **Robert Pienta**. 15th IEEE International Conference On Machine Learning And Applications (ICMLA) 2016. December 18-21, 2016.

VISAGE: Interactive Visual Graph Querying. **Robert Pienta**, Acar Tamersoy, Alex Endert, Shamkant B. Navathe, Hanghang Tong, Duen Horng (Polo) Chau International Working Conference on Advanced Visual Interfaces (AVI 2016). June 7-10, 2016. Bari, Italy.

Making Sense of Graph Query Results: Interactive Summarization and Exploration. **Robert Pienta**, Alex Endert, Shamkant Navathe, Duen Horng Chau. Poster Abstract, IEEE VIS 2016. Oct 23 - 28, 2016. Baltimore, Maryland, USA.

STEPS: A Spatio-temporal Electric Power Systems Visualization. **Robert Pienta**, Leilei Xiong, Santiago Grijalva, Duen Horng Chau, Minsuk Kahng. ACM Conference on Intelligent User Interfaces (IUI). March 7-10, 2016. Sonoma, GA, USA.

Call me: Gathering threat intelligence on telephony scams to detect fraud. Aude Marzuoli, Hassan Kingravi, David Dewey, Aaron Dallas, Telvis Calhoun, Terry Nelms, and **Robert Pienta**. Blackhat 2016.

A Visual Analytics Approach to Understanding Care Process Variation and Conformance. Rahul C. Basole, Hyunwoo Park, Mayank Gupta, Mark L. Braunstein, Duen Horng Chau, Michael Thompson, Vikas Kumar, **Robert Pienta**, and Minsuk Kahng. In Proceedings of the 2015 Workshop on Visual Analytics in Healthcare (VAHC 2015), 2015.

GraSP: Distributed Streaming Graph Partitioning. Casey Battaglino, **Robert Pienta**, and Richard Vuduc, In Knowledge Discovery and Datamining 2015 Workshop on High Performance Graph Mining, 2015.

AdaptiveNav: Adaptive Discovery of Interesting and Surprising Nodes in Large Graphs. **Robert Pienta**, Zhiyuan Lin, Minsuk Kahng, Jilles Vreeken, Partha P. Talukdar, James Abello, Ganesh Parameswaran, and Duen Horng Chau. In IEEE Visual Analytics Science and Technology (VAST), 2015.

Scalable graph exploration and visualization: Sensemaking challenges and opportunities. Robert Pienta, James Abello, Minsuk Kahng, and Duen Horng Chau In 2015 International Conference on Big Data and Smart Computing, BIGCOMP 2015, Jeju, South Korea, February 9-11, 2015, pages 271–278, 2015.

Interactive Querying over Large Network Data: Scalability, Visualization, and Interaction Design. Robert Pienta, Acar Tamersoy, Hanghang Tong, Alex Endert, and Duen Horng Chau. In Proceedings of the 20th International Conference on Intelligent User Interfaces Companion, IUI 2015, Atlanta, GA, USA, March 29 - April 01, 2015, pages 61–64, 2015.

Identifying Successful Investors in the Startup Ecosystem. Srishti Gupta, Robert Pienta, Acar Tamersoy, Duen Horng Chau; and Rahul C. Basole. In 2015 IEEE World Wide Web (WWW) Conference, Florence Italy, 2015.

MAGE: Matching approximate patterns in richly-attributed graphs. Robert Pienta, Acar Tamersoy, Hanghang Tong, and Duen Horng Chau. In 2014 IEEE International Conference on Big Data, (BigData) 2014, Washington, DC, USA, October 27-30, 2014, pages 585–590, 2014.

Towards scalable graph computation on mobile devices. Yiqi Chen, Zhiyuan Lin, Robert Pienta, Minsuk Kahng, and Duen Horng Chau. In 2014 IEEE International Conference on Big Data, (BigData) 2014, Washington, DC, USA, October 27-30, 2014, pages 29–35, 2014.

On the parallel simulation of scale-free networks. Robert Pienta, S.; and Richard M. Fujimoto. In SIGSIM Principles of Advanced Discrete Simulation, SIGSIM-PADS '13, Montreal, QC, Canada, May 19-22, 2013, pages 179–188, 2013.

A Comparative Analysis of Thermal and Visual Modalities for Automated Facial Expression Recognition. Avinash Wesley, Pradeep Buddharaju, Robert Pienta, and Ioannis Pavlidis. In Advances in Visual Computing - 8th International Symposium, ISVC 2012, Rethymnon, Crete, Greece, July 16-18, 2012, Revised Selected Papers, Part II, pages 51–60, 2012.

Teaching, Guest Lectures & Mentoring

Spring 2016 **Volunteer Instructor**
Georgia Institute of Technology, Atlanta, GA
As part of the FLAMEL program, taught how the use the python programming language for material science automation, modeling, and analysis.

Spring 2015 **Guest Lecturer**
Georgia Institute of Technology, Atlanta, GA
Guest lectured in the graduate Data and Visual Analytics course (CSE 6242) for Polo Chau.
Over 180 students!

Spring 2014 **Graduate Teaching Assistant**
Georgia Institute of Technology, Atlanta, GA

Assisted in teaching and administering the graduate Data and Visual Analytics course (CSE 6242). Over 100 students!

Spring 2012 **Graduate Teaching Assistant**
Georgia Institute of Technology, Atlanta, GA
Assisted in teaching and administering Advanced Modeling and Simulation: Fundamentals & Implementation (CSE6730)

Mentor
Georgia Institute of Technology, Atlanta, GA
2015 Srishti Gupta, Master's Student, CSE
2013-2014 Zhiyuan Lin, Undergraduate Student, CS
2015-2017 Dezhi Fang, Undergraduate Student, CS

Technical Skills

Programming: Python, Javascript, C/C++, R, SQL, Cypher
Web & Visualization: D3, React, WebGL, Three.js, Deck.gl, MapboxGL
High Performance Computing: MapReduce, OpenMP, MPI
Design: Photoshop, Lightroom, Premiere, Affinity Designer

Professional & Academic Service

Reviewer or Program Committee Member
2017 TIST Journal
2016–2017 IDEA
2015-2016 KDD
2014-2016 CHI
2014-2016 IUI
2016 WSDM

Member
2016-2017 Society for Applied Mathematics (**SIAM**)
2014-2017 Association for Computing Machinery (**ACM**)
2012-2017 Institute of Electrical and Electronics Engineers (**IEEE**)
2009-2011 Member of Pi Mu Epsilon
2008-2011 Member of Upsilon Pi Epsilon
2009-2011 Vice President of Upsilon Pi Epsilon

References available upon request. Live long and prosper.

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