

BRET LOWELL JACKSON

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Department of Math, Stats, & CS
Macalester College
1600 Grand Ave.
St. Paul, Minnesota 55105

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<http://www.bret-jackson.com>

EDUCATION

| | |
|-----------|---|
| 2009–2014 | PhD Computer Science University of Minnesota, Minneapolis, MN <i>Expressive Spatial Interfaces for Scientific Visualization and Artistic 3D Modeling</i> Advisor: Daniel F. Keefe |
| 2013 | M.S. Computer Science University of Minnesota, Minneapolis, MN Advisor: Daniel F. Keefe |
| 2004–2008 | B.A. Computer Science Carleton College, Northfield, MN Magna Cum Laude |

ACADEMIC EMPLOYMENT

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|----------------------|---|
| 2016–present | Assistant Professor (tenure-track) Macalester College, St. Paul, MN |
| 2014–2016 | Visiting Assistant Professor Macalester College, St. Paul, MN |
| Summer 2015, 2016 | Visiting Assistant Professor Carleton College Summer Computer Science Institute, Northfield, MN |
| 2010–2013 | Graduate Research Assistant University of Minnesota, Minneapolis, MN |
| 2010–2012 | Graduate Teaching Assistant University of Minnesota, Minneapolis, MN CSCI 1113 – Introduction to C/C++ Programming for Scientists and Engineers, 4 semesters |
| 2010–2011 | Graduate Lab Manager Virtual Reality Lab, University of Minnesota, Minneapolis, MN |

RELEVANT NON-ACADEMIC EMPLOYMENT

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| 2008–2010 | Software Developer, Ultralingua Inc., Minneapolis MN Windows, smartphone, and online multilingual dictionary development |
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PUBLISHED SCHOLARLY WORK

Note: In my research field, conferences are the primary publication venue over journal publication¹. They are just as, if not more, selective and commonly use multiple rounds of double-blind review. As a result, it is now typical for

¹<https://goo.gl/Kpw856>

conference proceedings to be published in journal special issues. Publications and accompanying videos are available online at <http://www.bret-jackson.com/publications.html>. Macalester undergraduate students are indicated with *s next to their names.

PUBLISHED

PEER-REVIEWED JOURNAL AND CONFERENCE ARTICLES

Bret Jackson, *Kayla Beckham, *Anael Kuperwajs Cohen, and Brianna C Heggeseth. “Comparing Convex Region-of-Interest Selection Techniques for Surface Geometry”. In: *Proceedings of VRST '19: 25th ACM Symposium on Virtual Reality Software and Technology*. Parramatta, NSW, Australia: Association for Computing Machinery, 2019, pp. 19–26.

This collaborative work with two Macalester students is the first formal comparison for 3DUI region-of-interest selection techniques. I mentored the students in implementing the interfaces for comparison, ran the study and interpreted the results. Prof. Heggseth collaborated on the statistical analysis. (Acceptance rate: 20.85%).

Shilad Sen, *Anja Beth Swoap, Qisheng Li, *Ilse Dippenaar, *Monica Ngo, *Sarah Pujol, *Rebecca Gold, *Brooke Boatman, *Brent Hecht, and Bret Jackson. “Toward Universal Spatialization Through Wikipedia-Based Semantic Enhancement”. In: *ACM Transactions on Interactive Intelligent Systems* 9.2–3 (Apr. 2019).

This is a journal extension to our 2017 IUI conference paper. My major contribution to this extension was the design of a novel user study methodology grounded in measurements of human perception tasks.

Bret Jackson, *Brighten Jelke, and *Gabriel Brown. “Yea Big, Yea High: A 3D User Interface for Surface Selection by Progressive Refinement in Virtual Environments”. In: *Proceedings of the IEEE Conference on Virtual Reality and 3D User Interfaces (VR)*. IEEE, 2018, pp. 320–326.

This is my first independent publication with two Macalester students. The work presents a 3D user interface for selecting portions of virtual objects. (Acceptance rate: 20.5%).

Shilad Sen, *Anja Beth Swoap, *Qisheng Li, *Brooke Boatman, *Ilse Dippenaar, *Rebecca Gold, *Monica Ngo, *Sarah Pujol, Bret Jackson, and Brent Hecht. “Cartograph: Unlocking Spatial Visualization Through Semantic Enhancement”. In: *Proceedings of the ACM Intelligent User Interfaces Conference*. ACM, 2017.

This project grew out of a summer research collaboration that my Macalester colleague, Shilad Sen, had with the students listed as co-authors. Although I was not directly involved with creating the algorithm, my main contributions were in designing and performing a user evaluation of the technique. I was also substantially involved in writing the related work and evaluation sections of the paper and co-presenting at the conference. (Acceptance rate: 23%).

Bret Jackson and Daniel F. Keefe. “Lift-Off: Using Reference Imagery and Freehand Sketching to Create 3D Models in VR”. in: *IEEE Transactions on Visualization and Computer Graphics* 22.4 (2016), pp. 1442–1451. Also presented at the Best of IEEE VR session at SIGGRAPH 2016.

In this work, we propose a novel 3D user interface for controlled 3D modeling. The initial conceptualization and coding development was a major portion of my dissertation work. After arriving at Macalester, I established an ongoing collaboration with an architect as an expert user. Based on his feedback, I continued to refine the user interface. The architect then completed a longitudinal study using the interface which became the basis for a major evaluation portion of the paper. I consider IEEE Virtual Reality to be the top conference for publishing in the VR field. The proceedings were then published in a special issue of IEEE TVCG. I was also invited to present the paper at SIGGRAPH, the premier graphics conference, at the “Best of IEEE VR session”. (Acceptance rate: 12.6%).

Kyungyoon Kim, Bret Jackson, Ioannis Karamouzas, Moses Adeagbo, Stephen Guy, Richard Graff, and Daniel F. Keefe. “Bema: A Multimodal Interface for Expert Experiential Analysis of Political Assemblies at the Pnyx in Ancient Greece”. In: *Proceedings of the IEEE 10th Symposium on 3D User Interfaces*. 2015, pp. 19–26.

We present a user interface that explores the combination of several classical interaction techniques for navigating in space and time through virtual reconstructions of ancient Greek speaking sites. I started this project as a graduate student in 2012, although it was not part of my dissertation. After arriving at Macalester, I helped mentor Kyungyoon Kim in this project, who at the time was a first year PhD student at the UMN. I had major contributions in writing the code for the system, as well as in writing several sections in the paper. The 3DUI symposium is attached to the IEEE VR conference and is the premier venue for presenting 3D user interface work. (Acceptance rate: 32%).

Bret Jackson, Tung Yuen Lau, David Schroeder, Kimani C. Toussaint Jr., and Daniel F. Keefe. “A Lightweight Tangible 3D Interface for Interactive Visualization of Thin Fiber Structures”. In: *IEEE Transactions on Visualization and Computer Graphics* 19.12 (2013), pp. 2802–2809.

This article introduces a 3DUI interface for navigating visualizations of 3D data such as tissue fibers, fluid flow, or neural pathways in the brain. It represents a chapter in my dissertation, and it brings together work in HCI, visualization, and computer vision for tracking and identifying tissue orientations. It was published at the IEEE Visualization conference, which is the top conference for visualization related work. (Acceptance rate: 24.6%)

Bret Jackson, Dane Coffey, and Daniel F. Keefe. “Force Brushes: Progressive Data-Driven Haptic Selection and Filtering for Multi-Variate Flow Visualizations”. In: *Proceedings of EuroVis 2012*. Vienna, Austria: Eurographics Association, 2012, pp. 7–11.

This paper presents a user interface for filtering and querying a visualization of volumetric data using a haptic force-feedback device. I led the project and was heavily involved in both the coding and writing. EuroVis is one of the top visualization conferences. (Short papers acceptance rate 42%).

Bret Jackson, David Schroeder, and Daniel F. Keefe. “Nailing down multi-touch: anchored above the surface interaction for 3D modeling and navigation”. In: *Proceedings of the 2012 Graphics Interface Conference*. GI '12. Toronto, Ontario, Canada, 2012, pp. 181–184.

This paper introduces a user interface for navigating 3D visualizations using multi-touch and in-air gestures. I led the project in conceptualizing the interface, developing the system code, and writing the paper. My graduate colleague, David Schroeder, worked on implementing hand tracking using a depth-sensing camera. (Acceptance rate 38%).

David Barbella, Sami Benzaid, Janara Christensen, Bret Jackson, Victor Qin, and David Musicant. “Understanding Support Vector Machine Classifications: A Local Approach”. In: *Proceedings of The International Conference on Data Mining (DMIN '09)*. CSREA Press, 2009, pp. 305–311

This paper presented a technique for understanding the results of support vector machine classifications by visualizing the results using a recommender-systems approach. The paper developed from my undergraduate capstone project at Carleton College. I contributed in developing portions of the system code and writing initial drafts of the paper.

BOOK CHAPTERS

Bret Jackson and Daniel F. Keefe. “From Painting to Widgets, 6-DOF Stylus Input Beyond the Pointing Metaphor”. In: *VR Developer Gems*. Ed. by William Sherman. CRC Press, 2019. Chap. 14, pp. 243–268.

I was invited to contribute a chapter to a new VR Programming Gems book. The book is in the style of the GPU Gems series, a well known and widely distributed collection of books about computer graphics techniques. This will be the start of a new series based on virtual reality techniques, and it has the potential to reach a wide ranging audience in the research community as well as in industry.

PEER-REVIEWED WORKSHOP PAPERS

Bret Jackson. “OVR Stylus: Designing Pen-Based 3D Input Devices for Virtual Reality”. In: *Proceedings of the 2020 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW), NIDIT: Workshop on Novel Input Devices and Interaction Techniques*. IEEE, 2020, pp. 13–18

This paper presents a design alternative to commercial 3D pen input devices. The paper includes a thorough discussion of design considerations and motivations, components, manufacturing processes, software, and lessons learned. The hardware and software design are released under an open source license and are widely available on Github. I was the only author and creator of the stylus design.

Seth Johnson, Bret Jackson, Bethany Tourek, Marcos Molina, Arthur G. Erdman, and Daniel F. Keefe. “Immersive Analytics for Medicine: Hybrid 2D/3D Sketch-Based Interfaces for Annotating Medical Data and Designing Medical Devices”. In: *Proceedings of the 2016 ACM Companion on Interactive Surfaces and Spaces, Immersive Analytics: Exploring Future Interaction and Visualization Technologies for Data Analytics Workshop*. ISS Companion '16. New York, NY, USA: ACM, 2016, pp. 107–113.

This paper is an extension to the Lift-Off 3D modeling paper listed above that I worked on collaboratively with Seth Johnson, a PhD student in my former graduate lab at the UMN. The paper presents an evaluation for how the lift-off modeling process could be used in the medical domain. Although Seth led the project, I contributed in its conceptualization, modification of code, and writing the introduction and related work sections of the paper.

Bret Jackson, Dane Coffey, Lauren Thorson, David Schroeder, Arin Ellingson, David Nuckley, and Daniel F. Keefe. *Toward Mixed Method Evaluations of Scientific Visualizations and Design Process as an Evaluation Tool*. BELIV 2012: Beyond Time and Errors: Novel Evaluation Methods for Visualization, Workshop at IEEE VisWeek. 2012.

This paper describes an art-critique based approach to evaluating visualization systems that grew out of the challenges we have developing appropriate evaluations of different visualization approaches. I led the project and writing of the paper.

Dane Coffey, Bret Jackson, and Daniel F. Keefe. *Immersive VR Touch Workbenches: Applications in Engineering and Art*. The 3rd Dimension of CHI (3DCHI) Touching and Designing 3D User Interfaces Workshop at CHI. 2012.

This paper presents a series of case studies illustrating how a VR touch workbench could address specific domain challenges for 3D work in engineering and art practice. The project was led by Dane Coffey. I contributed to writing one of the case studies.

Bret Jackson and Daniel F. Keefe. *Sketching Over Props: Understanding and Interpreting 3D Sketch Input Relative to Rapid Prototype Props*. IUI 2011 Sketch Recognition Workshop. 2011.

This paper presents a user study evaluating a system of mid-air gestures done in relation to a 3D printed prop that can be used to control a visualization system. It was exciting because it was my first long paper as a graduate student. (Acceptance rate for long papers: 26%)

Bret Jackson, Kyungyoon Kim, Richard Graff, Azadeh Rabbani, Christopher L. Johnstone, and Daniel F. Keefe. *Immersive VR for Visualizing Ancient Greek Rhetoric*. Immersive Visualization Revisited: Challenge and Opportunities Workshop at IEEE VR 2012. 2012.

This is a position paper that describes the advantages and challenges of using immersive virtual reality for cultural heritage projects. It setup and has formed the basis for an ongoing collaboration with a scholar of ancient Greece. I formulated the ideas and wrote the majority of the paper.

PANELS

Daniel Acevedo-Feliz, Bret Jackson, Daniel Keefe, Ryan Pavlik, Jurgen Schulze, Bill Sherman, and Alexis Vartanian. *VR Toolkits: Why do We Keep Reinventing the Wheel?* IEEE Virtual Reality 2014 Panel. 2014.

I presented on this panel at the IEEE Virtual Reality conference about the MinVR software library that I wrote to support development of VR applications.

POSTERS

Kyungyoon Kim, Bret Jackson, Ioannis Karamouzas, Stephen J. Guy, Richard Graff, and Daniel F. Keefe. *Poster: Immersive Visualization and Spatial Analysis of Oratorical Performance Venues in Ancient Greece*. CRA-W Grad Cohort Workshop. 2013

Kyungyoon Kim, Bret Jackson, Ioannis Karamouzas, Stephen J. Guy, Richard Graff, and Daniel F. Keefe. *Poster: Immersive Visualization and Spatial Analysis of Oratorical Performance Venues in Ancient Greece*. Minnesota Supercomputing Institute Research Exhibition. 2013

Bret Jackson, Kyungyoon Kim, Lauren Thorson, Richard Graff, Azadeh Rabbani, Christopher L. Johnstone, and Daniel F. Keefe. *Poster: Visualizing Ancient Greek Rhetoric in Immersive Virtual Reality*. U-Spatial Symposium 2012 (Best Poster Humanities Category). 2012

Kyungyoon Kim, Bret Jackson, Lauren Thorson, Richard Graff, Azadeh Rabbani, Christopher L. Johnstone, and Daniel F. Keefe. *Poster: Visualizing Ancient Greek Rhetoric in Immersive Virtual Reality*. Minnesota Supercomputing Institute Research Exhibition 2012 (Best Poster Finalist). 2012

Vamsi Konchada, Bret Jackson, Trung Le, Iman Borazjani, Fotis Sotiropoulos, and Daniel F. Keefe. *Poster: Supporting Internal Visualization of Biomedical Dataset via 3D Rapid Prototypes and Sketch-based Gestures*. Interactive Graphics and Games 2011. 2011

This was a peer-reviewed poster for a project initially led by Vamsi Konchada, a masters student in my graduate lab. I contributed to the code development and writing for the poster.

INVITED PRESENTATIONS

Getting Beyond the Novelty Effect: Appropriate Use of Immersive Technology in the Classroom. Building ACM-wide partnerships for developing virtual-/augmented-reality tools for pedagogy, A workshop supported by the Associated Colleges of the Midwest program for Faculty Career Enhancement. Grinnell College, July 16, 2019

Supporting Cross-Curricular Connections through Data Visualization. Serie Center's "Talking about Teaching" program. Macalester College, March 2nd, 2018

Digital Modeling, Interactive Visualization, and the Oratorical Performance Spaces of Ancient Greece. Carleton College Day of Digital Humanities. June 2nd, 2017

The Allegory of the CAVE: Designing a Virtual Reality Display for Immersive Applications in Science and Art. Serie Center's "Conversations About Our Scholarly Lives" program. Macalester College, May 1st, 2017

Time Travel is Possible: Computational Tools to Support Experiential Analysis of Oratorical Venues in Ancient Greece. Archeological Institute of America, Minnesota Chapter. Sept. 22th, 2016

3D Design and Virtual Reality. Bret Jackson and Austin Mason. Macalester Spring Professional Activities Workshop, Digital Liberal Arts Track. May 2016

I co-organized and led this workshop on integrating 3D modeling and virtual reality as pedagogical tools to support classroom learning. The participants rated the workshop an average of 3.8 out of 4 points and all felt that it would be very beneficial to their teaching.

Time Travel is Possible: Computational Tools to Support Experiential Analysis of Oratorical Venues in Ancient Greece. Serie Center's "Conversations About Our Scholarly Lives" Program. Macalester College, Oct. 26th, 2015

Life as a Computer Scientist, Summer Computer Science Institute, Carleton College, Aug. 14th, 2014

Spatial Human-Computer Interaction Techniques for Visualization and Art. Carleton College Computer Science Colloquium, Nov. 1st 2012

Interactive Visualization Research. CSCI 4107 Introduction to Computer Graphics Programming, Guest Lecture, May 2012

Visualization in Virtual Reality. CSCI 5980: Interacting in Virtual Worlds, Guest Lecture, Nov 2011

SOFTWARE AND HARDWARE ARTIFACTS

MinVR

MinVR is a low-level C++ library that supports writing virtual reality applications. It supports interaction with multiple VR input devices and display configurations (e.g. fish-tank VR displays, powerwalls, and CAVE systems), while allowing for integration with a variety of graphics toolkits (e.g. raw OpenGL, GLFW, G3D, Glut, OpenSceneGraph, etc.). It supports multi-threaded rendering with multiple graphics contexts, as well as networked cluster rendering. Version 1 can be found at <https://github.com/minvr/minvr-old>, while the version 2 can be found at <https://github.com/minvr/minvr>.

I developed version 1 of this library while in graduate school. Since arriving at Macalester, I have been collaborating with professors and students at UMN and Brown University to write MinVR2. Although I have done less of the coding on version 2, I have been active in guiding the development of the library, and major portions of the design and code that I wrote in the first version have been integrated into the second version.

UMN Interactive Visualization Lab VR CAVE The IVLab CAVE is a four-walled, eight projector, stereoscopic, virtual reality display. Built using off-the-shelf components, it is a comparably low cost CAVE display system designed to be installed and used daily in a research lab at the University of Minnesota. It has been used in many interdisciplinary research projects, and has been featured in many university tours and significant research demos including with: Medtronic (Vice President of Research and Development and team), Minneapolis Institute of Arts, Director of Technology, Walt Disney Imagineering Virtual Reality Group, Boston Scientific Corporation (9 Vice Presidents and other leadership invited by UMN President Erik Kaler), US Congressman Erik Paulsen, and University of Minnesota President Eric Kaler.

I was responsible for designing and building the CAVE display. This included modeling the system in AutoCAD, identifying and ordering parts, construction, and calibration.

Macalester VR CAVE A four-walled, eight projector, stereoscopic virtual reality display designed as a second iteration of the UMN IVLab CAVE.

The design and construction of this CAVE has taken almost a year. Due to small space requirements in my lab, the design needed to be substantially modified. I plan on using this system in my research as well as integrating it into several of my classes including courses on visualization, game design, and computer graphics.

Open-Source Virtual Reality (OVR) Stylus The OVR interaction styluses are novel, open-source devices designed to be ultra-low powered 3D user input devices for a CAVE VR display. Each stylus contains two buttons, a sliding potentiometer, a micro-controller, and a Bluetooth Low-Energy radio inside a 3D printed sleeve. Shaped like a pen, these styluses have enabled a variety of software advances in the form of new user interfaces and data visualization strategies (e.g. the Lift-Off 3D modeling interface referenced above). The design is available at <https://github.com/bretjackson/OVRStylus/>.

I developed the first version of these styluses while in graduate school. They have been in continuous use at the University of Minnesota for the last 6 years. Researchers at Brown University also created a copy. At Macalester, I developed the second version hardware design that added additional sensors and miniaturized the components.

HONORS & AWARDS

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| 2013-2014 | University of Minnesota Doctoral Dissertation Fellowship (151 fellowships awarded from 284 department nominations. Nominations represent 11.5% of eligible students) |
| 2013 | IEEE Virtual Reality Doctoral Consortium Participant (Acceptance rate: 38%) |

RESEARCH AND TEACHING GRANTS

“Integrating Physical Reference Materials into Immersive 3D Modeling Systems”, \$11,000, Macalester College Collaborative Summer Research Grant Program, May 25th, 2020 to July 31st, 2020.

Course Innovation Grant, \$2,265, Macalester College Mellon Making Meaning Grant Fund, 2020.

Conference Travel Grant, \$3,146.44, Macalester College Wallace Scholarly Activities, Fall 2019.

“Building ACM-wide partnerships for developing virtual/augmented-reality tools for pedagogy”, \$37,598, Associated Colleges of the Midwest Faculty Career Enhancement Program (ACM FaCE), 2018.

“Video Games: Coding, Narrative, and Life in VR”, \$1000 stipend and funding for a course replacement. Macalester Fund for the Advancement of Collaborative Teaching. 2018.

“Visualizing Uncertainty in Reconstructions of Ancient Greek Speaking Sites”, \$4,950, Macalester College Collaborative Summer Research Grant Program, May 29th, 2017 to August 4th, 2017.

International travel grant, \$3960, Macalester College Wallace Scholarly Activities, Fall 2016

Department award to support 24 undergraduate women summer researchers in computer science, \$228,792, Clare Booth Luce 2017-2019

“Supporting Exploratory Visualization of Multidimensional Data Using Anchored Multitouch Gestures”, \$12,850, Macalester College Collaborative Summer Research Grant Program, May 18th, 2015 to July 24th, 2015.

TEACHING EXPERIENCE

| | | | |
|---------|--|-----------------------------|-------------|
| COMP194 | FYC: Interacting with Virtual Worlds: 3DUI and VR | Macalester College | Fall 2020 |
| COMP394 | Video Games: Coding, Narrative and Life in VR | Macalester College | Fall 2020 |
| COMP225 | Data Structures | Macalester College | Spring 2020 |
| COMP128 | Data Structures | Macalester College | Spring 2020 |
| COMP225 | Software Design and Development (2 Sections) | Macalester College | Fall 2018 |
| COMP465 | Interactive Computer Graphics | Macalester College | Fall 2018 |
| COMP124 | Object-Oriented Programming and Data Structures (2 Sections) | Macalester College | Spring 2018 |
| COMP225 | Software Design and Development | Macalester College | Spring 2018 |
| COMP494 | Data Visualization | Macalester College | Fall 2017 |
| COMP124 | Object-Oriented Programming and Data Structures | Macalester College | Fall 2017 |
| COMP494 | Interactive Computer Graphics | Macalester College | Spring 2017 |
| COMP225 | Software Design and Development | Macalester College | Spring 2017 |
| COMP124 | Object-Oriented Programming and Data Structures (2 Sections) | Macalester College | Fall 2016 |
| COMP225 | Software Design and Development | Macalester College | Spring 2016 |
| COMP124 | Object-Oriented Programming and Data Structures (2 Sections) | Macalester College | Spring 2016 |
| COMP124 | Object-Oriented Programming and Data Structures (2 Sections) | Macalester College | Fall 2015 |
| COMP124 | Object-Oriented Programming and Data Structures (2 Sections) | Macalester College | Spring 2015 |
| COMP394 | Interactive Computer Graphics | Macalester College | Spring 2015 |
| COMP346 | Internet Computing | Macalester College | Fall 2014 |
| COMP124 | Object-Oriented Programming and Data Structures | Macalester College | Fall 2014 |
| SCSI | Virtual Reality | Carleton College | |
| | | Summer Comp. Sci. Institute | Summer 2016 |
| SCSI | Virtual Reality | Carleton College | |
| | | Summer Comp. Sci. Institute | Summer 2015 |

ADVISING AND MENTORING

ACADEMIC ADVISOR

† Indicates Graduated

Vihan Agarwal[†]
Jennifer Arnold[†]
Gabriel Brown[†]
Lawson Busch[†]
George Clare Kennedy
David Colby[†]
Mark Coretsopoulos[†]
Trevor Cramer[†]
Amanda Doan[†]
Kyler Fullerton
Sara Rose Havener[†]
Dakotta Heacock[†]
Holly Hull[†]
Marie Julstrom[†]
Khin Kyaw[†]
Carl Liu[†]
Ling Ma
Kassandra Munguia[†]
Roland Munsil[†]
Courtney Overland[†]
Paige Pfeiffer[†]
Corey Pieper
Julia Romare[†]
Nathaniel Tesfaye[†]
Emerald Thole[†]
Kai Walberg[†]
Arif Zamil
Yiping Zhong

CAPSTONE / THESIS ADVISOR

Ashley Helfinstein
B.A. in computer science, Macalester College, 2020
Extracting Meaning: an exploration of automatic text summarization techniques **Awarded MSCS Capstone Prize**

Juliet Kelson
B.A. in computer science, Macalester College, 2020
Make It Rain: Modeling Rain and Water in Computer Graphics

Carl Liu
B.A. in computer science, Macalester College, 2020
Imagining a Nonvisual Game

Charlotte Roux
B.A. in computer science, Macalester College, 2020
Hacking Visual Art. Easy drawing in 3d Space.

Harrison Runnels
B.A. in computer science, Macalester College, 2020
The Great Turtle War **Awarded MSCS Capstone Prize**

Kiet Tran
B.A. in computer science, Macalester College, 2020
Ray Tracing: Modeling Realistic Light in Computer Graphics

Dongmin Park
B.A. in computer science, Macalester College, 2018
What color is this Song?

Eloa Franca Verona
B.A. in computer science, Macalester College, 2018
Visualizing gender wage gap - Country comparisons

Haihan Lin
B.A. in computer science, Macalester College, 2018
Reconstructing Surfaces from 3D Point Clouds

Kassandra Munguia
B.A. in computer science, Macalester College, 2018
“Another Space Movie?!”: Visualizing the Relationship Between Current Events and Movie Genre Popularity

Paul Chery
B.A. in computer science, Macalester College, 2018
Mapping Police Killings in the United States

Eloise Terry
B.A. in computer science, Macalester College, 2017
Uncovering Alzheimer’s Disease in fMRI images Using an Artificial Neural Network (Awarded MSCS Capstone Prize),

Connor Valenti
B.A. in computer science, Macalester College, 2017
140 Characters to the White House: An Analysis of the 2016 Presidential Election on Twitter

Mitchell Peterson
B.A. in computer science, Macalester College, 2017
Music and Subjectivity: Classifying Musical Genre using Machine Learning

Hyun Uk Jeong
B.A. in computer science, Macalester College, 2017
Analyzing Human Language with Computers

Oliver Koo
B.A. in computer science, Macalester College, 2016
Multi-Finger Anchored Gestures

Asra Nizami
B.A. in computer science, Macalester College, 2016
Computational Creativity: Evaluating the impact of 3D human-computer interfaces

Jenweil Yang
B.A. in computer science, Macalester College, 2016
Gestures for 3D Human-Computer Interaction

Chan Hyun Park
B.A. in computer science, Macalester College, 2016
Optical Character Recognition Using the Discrete Cosine Transform

Tyler Skluzacek
B.A. in computer science, Macalester College, 2016
myBivy: A wearable sleeping solution

REVIEW COMMITTEES

Jeffrey Lyman
B.A. in computer science, Macalester College, 2016
Blossom, a Language Built to Grow
Committee member

INDEPENDENT STUDY SUPERVISOR

Anael Kuperwajs Cohen
Kiante Miles
Ali Mahad
Haihan Lin
Jennifer Arnold
Asra Nizami
Will Kent-Daggett

INTERNSHIP LIAISON

Ling Ma
IT Coordinator, EXPLO
Software Engineering Internship, Audible

Yiping Zhong
SharePoint Project Internship, Living Well Disability Services

Juan David Garrido Rojas
Lead Web Developer, Eir Systems Inc
Researcher, University of Chicago

Julia Romare
Research and Web Development Intern, Gaddr

Haimeng Zhang
Software Engineering Intern, Software for Good

Dakota Heacock
Developer, Cloudburst SBC

Khin Kyaw
Software Engineer, TCF Bank

Qinxi Wang
Web Development Intern, Similarity

Ivana Marincic
Software Development Intern, Work Effects

SERVICE

Conference Organization

Program Committee, IEEE Virtual Reality 2019, 2020
Session Chair, IEEE Virtual Reality 2019, 2020
Conference Program Committee, IEEE Virtual Reality 2018
Program Committee, IEEE Symposium on 3D User Interfaces, 2015, 2016, 2017
Session Chair, IEEE Symposium on 3D User Interfaces, 2017
Doctoral Consortium Chair, IEEE Virtual Reality 2014

PAPER REVIEWING FOR JOURNALS AND CONFERENCES

Reviewer – IEEE Transactions on Visualization & Computer Graphics, 2019, 2020
Reviewer – IEEE International Symposium on Mixed and Augmented Reality (ISMAR), 2019
Reviewer – ASME Journal of Computing and Information Science in Engineering (JCISE) , 2019
Reviewer – EG/VGTC conference on Visualization (EuroVis), 2019
Reviewer – IEEE Visualization 2017, 2019
Reviewer – ACM Symposium on Spatial User Interaction 2015, 2016, 2018
Reviewer – Advances In Computers and Information in Engineering Research, ASME Press, 2018
Reviewer – Computers & Graphics Journal 2016, 2017, 2018
Reviewer – ACM CHI Conference on Human Factors in Computing Systems 2013, 2018
Reviewer – IEEE Symposium on 3D User Interfaces 2015, 2016, 2017
Reviewer – ACM Symposium on Virtual Reality Software and Technology 2016
Reviewer – Journal of Behavior and Information Technology 2015, 2016
Reviewer – Computer-Aided Design 2015, 2016
Reviewer – Informatics, 2016, 2017
Reviewer – Journal of Innovative Optical Health Sciences 2016
Reviewer – IEEE Pervasive Computing 2015

Reviewer – IEEE Virtual Reality 2014, 2015

Reviewer – Computers and Graphics Journal special issue on Touching the 3rd Dimension 2012

Reviewer – Computers and Graphics Journal special issue on Graphics Interaction 2012

Reviewer – Foundations of Digital Games Conference (FDG) 2012

COLLEGE AND DEPARTMENT SERVICE

Macalester College Water Polo Academic Liason 2019–2020

Macalester College MSCS Department Webmaster 2017–2020

Macalester College MSCS Department Seminar Co-organizer, 2015–2016, 2016–2017, 2017–2018

Committee Member, AIA-Sciences Search 2017

Volunteer Assistant Coach, Macalester Water Polo 2014-present

PUBLIC OUTREACH

Graduate Lab open house event for 35 K-12 students participating in a TRIO Upward Bound program, 2013

Graduate Q&A welcome panel for potential computer science graduate students, 2011

Research demonstration for the University of Minnesota building, Minnesota State Fair 2011

Virtual reality lab tours for over 700 students of a variety of ages from local elementary schools, middle schools, and high schools, as well as prospective undergraduate students. 2010-2011