

DEPARTMENT OF COMPUTER SCIENCE • CALPOLY.  
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## ZOË J. WOOD

### RESEARCH INTERESTS

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Computer graphics and scientific visualization, including real-time graphics, geometric modeling, computational topology and rendering

### EDUCATION

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**2000 – 2003 California Institute of Technology Pasadena, CA**

Ph.D. Computer Science

■ Thesis: Computational Topology Algorithms for Discrete 2-manifolds

**1997 – 2000 California Institute of Technology Pasadena, CA**

M.S. Computer Science

■ Thesis: Semi-regular Mesh Extraction from Volumes

**1994 – 1997 University of California Santa Cruz, CA**

B.S. Computer Science

**1988 – 1992 University of California Santa Cruz, CA**

■ B.A. Women's Studies and American Studies

### PUBLICATIONS

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**Mixed Approaches to CS0: Exploring topic and pedagogy variance after six years of CS0**, Z. Wood, J. Clements, Z. Peterson, D. Janzen, H. Smith, M. Haungs, J. Workman, J. Bellardo, and B. Debruhl, *ACM SIGCSE (Special Interest Group on Computer Science Education)*, 2018

**Cinematographic and Geometric Criteria for Virtual Camera Path Generation for the Visualization of Shipwreck Data**, K. Davis, V. Viswanthan, C. Clark, T. Gambin, and Z. Wood, *Proc. of the 13<sup>th</sup> International Conference on Computer Graphics Theory and Applications (GRAPP 2018)*

**Intelligent Shipwreck Search Using Autonomous Underwater Vehicles**, J. Rutledge, W. Yuan, J. Wu, S. Freed, A. Lewis, Z. Wood, C. Clark, and T. Gambin, *IEEE International Conference on Robotics and Automation (ICRA 2018)*

**Pipeline for Reconstruction and Visualization of Underwater Archeology Sites using Photogrammetry**, S. Seibert von Fock, S. Bilich, K. Davis, V. Viswanthan, Z. Lobo, J. Lupanow, C. Clark, T. Gambin, Z. Wood, *Proc. of 32<sup>nd</sup> International Conference on Computers and Their Applications, CATA (2017) (awarded best paper)*

**AUV Motion-planning for Photogrammetric Reconstruction of Marine Archeological Sites**, V. Viswanthan, Z. Lobo, J. Lupanow, S. Seibert von Fock, **Z. Wood**, T. Gambin, C. Clark, *IEEE International Conference on Robotics and Automation (ICRA) (2017)*

**Computational Art - Introducing High School Students to Computing via Art**, **Wood, Z.J.**, Muhl, P. and Hicks, K., *Proceedings of ACM SIGCSE (Special Interest Group on Computer Science Education), 2016*

**Building Worlds: Bridging Imperative-First and Object-Oriented Programming in CS1-CS2**, **Wood, Z.J.** and Keen, A., *Proceedings of ACM SIGCSE (Special Interest Group on Computer Science Education), 2015*

**Surface Reconstruction of Ancient Water Storage Systems - An Approach for Sparse 3D Sonar Scans and Fused Stereo Images**, Nelson, E., Dunn, I., Forrester, J., Gambin, T., Clark, C.M., **Wood, Z.J.**, *Proc. of the 9<sup>th</sup> International Conference on Computer Graphics Theory and Applications (GRAPP2014)*

**Towards Three-Dimensional Underwater Mapping Without Odometry**, Dobke, A., Vasquez, J., Lieu, L., Chasnov, B., Clark, C., Dunn, I., **Wood, Z.J.**, *Proc. of the Unmanned Untethered Submersible Technology Conference (UUST 2013)*

**FlexRender: A Distributed Rendering Architecture for Ray Tracing Huge Scenes on Commodity Hardware**, Somers, R. and **Wood, Z.J.**, *Proc. of the 8<sup>th</sup> International Conference on Computer Graphics Theory and Applications (GRAPP2013)*

**Uncertainty Visualization and Hole Filling for Geometric Models of Ancient Water Systems**, Forrester, J., McVicker, W., Gambin, T., Clark, C.M., and **Wood, Z.J.**, *Proc. of the 4<sup>th</sup> International Conference on Information Visualization Theory and Applications (IVAPP2013)*

**Mapping and Visualizing Ancient Water Storage Systems with an ROV: An Approach Based on Fusing Stationary Scans within a Particle Filter**, McVicker, W., Forrester, J., Gambin, T., Lehr, J., **Wood, Z.J.**, and Clark, C.M., *Proc. of the IEEE International Conference on Robotics and Biomimetics (ROBIO2012)*

**Cross Teaching Parallelism and Ray Tracing: A Project-based Approach to Teaching Applied Parallel Computing** C. Lupo, **Z. J. Wood** and C. Victorino *Proceedings of ACM SIGCSE (Special Interest Group on Computer Science Education), 2012*

**An Approach to Point Based Approximate Color Bleeding with Volumes** Chris Gibson and **Zoë Wood** *Proceedings of ISVC, 2011*

**Surface Reconstruction of Maltese Cisterns using ROV Sonar Data for Archeological Study**  
C. Forney, J. Forrester, B. Bagley, W. McVicker, J. White, T. Smith, J. Batryn, A. Gonzlaez,  
J. Lehr, T. Gambin, C. Clark and **Z.J. Wood** *Proceedings of ISVC, 2011*

**Real-Time Visualizations of Ocean Data Collected by the NORUS Glider in Svalbard, Norway**  
D. Medina, M. Moline, C. M. Clark and **Z.J. Wood** *Proceedings of ISOPE, 2011*

**Finding Good Paths: Applications of Least Cost Caloric Computations**  
**Z.J. Wood**, G. Hoffman and M. Wazny *Proceedings of CATA, 2010*

**Energetic Path Finding Across Massive Terrain Data**  
A. Tsui and **Z. Wood** *Proceedings of ISVC, 2009 2008*

**User Driven Two-dimensional Computer Generated Ornamentation**  
Dustin Anderson and **Zoë Wood** *Proceedings of ISVC, 2008*

**Direct Extraction of Normal Mapped Meshes from Volume Data**  
Mark Barry and **Zoë Wood** *Proceedings of ISVC, 2008*

**Locating the Source of Topological Error in Reconstructed 3D Models**  
Eric Firestone, Craig Povey and **Zoë Wood** ,*Proceedings of SPIE Electronic Imaging, 2007*

**Using Hybrid Approaches to Solve the Challenges of Shape from Shading**  
Ryan Murphy and **Zoë Wood** *Proceedings of SPIE Electronic Imaging, San Jose, CA, January 2007*

**Interactive Thin Shells - A Model Interface for the Analysis of Physically-based Animation**  
James Skorupski, **Zoë Wood** and Alex Pang *Proceedings of CAINE, 2007*

**Discrete Shells Origami** Rob Burgoon, **Zoë Wood** and Eitan Grinspun  
*The 21st International Conference on Computers and Their Applications (CATA-2006)}, March 2006*

**Energetically Optimal Travel across Terrain: Visualizations and a New Metric of Geographic Distance with Archaeological Applications**  
Brian Wood and **Zoë Wood** *SPIE Electronic Imaging, January 2006*

**An Out-of-core Algorithm for Isosurface Topology Simplification**  
**Z. Wood**, Hu. Hoppe, M. Desbrun and P. Schröder *ACM Transactions on Graphics, 2004*

**Multi-chart Geometry Images** Pedro Sander, **Zoë Wood**, Steven Gortler, J. Snyder, H. Hoppe *Eurographics Symposium on Geometry Processing 2003*

**Topological Noise Removal**  
Igor Guskov and **Zoë Wood** *Proceedings of Graphics Interface 2001*

**Semi-regular Mesh Extraction from Volumes**  
**Zoë Wood**, Mathieu Desbrun, Peter Schröder and David Breen *Proceedings of IEEE Visualization 2001*

## PEER REVIEWED CONFERENCE PRESENTATIONS

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### **Applied computer graphics for intelligent search and mapping of shipwrecks**

**Zoë Wood** *Grace Hopper Celebration of Women and Computing 2017*

### **Workshop: Computational Art to introduce computing for CS0 and outreach**

**Zoë Wood**, and Julie Workman *Grace Hopper Celebration of Women and Computing 2015*

### **BOF: A Collaboration between Computer Science and Art**

**Zoë Wood**, and Enrica Lovaglio Costello *Grace Hopper Celebration of Women and Computing 2014*

### **Workshop: Computational art using Processing for CS0**

**Zoë Wood**, and Julie Workman *Grace Hopper Celebration of Women and Computing 2013*

### **Faculty Lightning Talk: The Blessings of a Broken Robot: valuable lessons for computer scientists about international engineering, field research and outreach**

**Zoë Wood** *Grace Hopper Celebration of Women and Computing 2013*

## EMPLOYMENT AND RESEARCH EXPERIENCE

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9/2003 –Present California Polytechnic State University San Luis Obispo, CA

### ***Professor***

- Research interests include geometric modeling, computational topology and scientific visualization

6 – 9/2002 Microsoft Corporation Bellevue, WA

### ***Research Intern for Microsoft Research***

- Implemented algorithms to represent geometric models as multi-chart geometry images

6 – 9/2001 Microsoft Corporation Bellevue, WA

### ***Research Intern for Microsoft Research***

- Explored and implemented new techniques for isosurface topology simplification

6 – 9/1998 Hewlett-Packard Research Labs Palo Alto, CA

### ***Research Intern***

- Explored and implemented a view-dependant texture mapping algorithm for the image-base modeling group

6 – 9/1997 NASA-Ames Research Center Moffett Field, CA

### ***Research Intern***

- Explored and implemented comparative visualization tools for wind tunnel data

## TEACHING

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Cal Poly: CSC 471 **Introduction to Computer Graphics**, 2003 (Fall), 2004 (Winter, Spring), 2005 (S), 2006 (S), 2007 (W), 2009 (S), 2010 (W), 2012 (F), 2013 (S), 2014 (W), 2015 (W), 2016 (W, F), 2017 (S, F)

Cal Poly: CSC 473 **Advanced Rendering Techniques**, 2010 (W), 2011 (S), 2013 (S)

Cal Poly: CSC 474 **Animation**, 2012 (F)

Cal Poly: CSC 476 **Real-time 3D Computer Graphics Software Systems**, 2004 (S), 2007 (S), 2008 (F), 2009 (S), 2010 (S), 2011 (W&S), 2012 (W), 2013 (W), 2014(S), 2015 (S), 2017 (W)

Cal Poly: CSC 570/572 (Graduatee) **Computer Graphics**, 2005 (W), 2006 (W), 2007 (W), 2008 (F), 2010 (S), 2011 (W), 2012(W), 2015 (S), 2017 (S)

Cal Poly: CSC 590 **Thesis Seminar**, 2012 (F),

Cal Poly: CSC 171 **Introduction to Interactive Entertainment**, 2009 (Fall)

Cal Poly: CSC 123 **Introduction to Computing**, 2011 (Fall), 2014 (f), 2015 (F), 2016 (F)

Cal Poly: CSC 101 **Fundamentals of Computer Science**, 2005 (F), 2006 (F), 2009 (W), 2014 (W)

Cal Poly: CSC 102 **Fundamentals of Computer Science II**, 2014 (S)

Cal Poly: CSC 203 **Project-Based Object-Oriented Programming and Design**, 2017 (F)

Caltech: Instructor CS 101.3 **Topics in Computer Graphics**, 2002 (Spring)

Caltech: Teaching Assistant CS 138ab **Algorithms**, 1999/00 (Fall/Winter)

#### AWARDS AND SERVICE

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NCWIT Engagement Excellence Award 2018

CSU Faculty Innovation and Leadership Award 2018

Cal Poly Distinguished Scholarship Award 2017- 2018

NCWIT Undergraduate Research Mentoring Award 2018

College of Engineering Outstanding Club Advisor Award 2014-2015

Computer Science Professor of the Year 2003-2004, 2012-2013, and 2014-2015

Celebration of Women in Computing in Southern California conference – program committee (2014)  
– General co-Chair (2016)

NCWIT Central California Aspirations in Computing (Local Coordinator – 2010 to 2017)

WISH: Women Involved in Software and Hardware (Advisor for CP student club)

IEEE Visualization program committee (2011, 2012, 2013, 2014, 2015)

Grace Hopper Celebration of Women in Computing – program committee (2011, 2014, 2015)

Faculty Advisor to NCWIT AspireIT junior high camp ‘Dream it Code it’, 2014 and 2015

Reviewer for ACM SIGGRAPH, IEEE Visualization, ACM TOG, Pacific Graphics, Shape Modeling International, IEEE Computer Graphics and Applications, IEEE Transactions on Visualizations and Computer Graphics, SIGCSE, ABI Grace Hopper Conference for Women in Computing

Pacific Graphics Program Committee (2007)

SIGGRAPH Courses Program Committee (2007)

Microsoft Research Fellowship 2001-2003

#### INVITED LECTURES AND COLLOQUIA

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Creative Coding Fest, UCLA, Septemeber 2018

Association for Women in Mathematics Research Symposium, Women in Shape Analysis (WiSH), UCLA March 2017

Caltech Computer Science Seminar, November 2016

Softec – The Central Coast Technology Alliance: Women in Technology Dinner – Panel member: Mentoring and Sponsorship, February 2016

Numerous outreach activities at elementary schools (Washington Elementary and Peabody Charter School) and High Schools (Santa Barbara High School and Dos Pueblos High School) 2011-present

Computer Science Department, University of California; Santa Barbara, December 2012

Department of Systems & Control Engineering, University of Malta, March 2012

Computer Science Department, University of California; Santa Cruz, December 2011

Cal Poly REU Summer Workshop, July 2010

Softec – The Central Coast Technology Alliance; research presentation, San Luis Obispo, Aug. 2010

NORUS Workshop, Cal Poly, November 2009

Computer Science Department, University of California; Santa Barbara, May 2007