

Jacob E. Becker

CONTACT INFORMATION (LOCAL) Department of Computer Science
Rensselaer Polytechnic Institute
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EDUCATION **Rensselaer Polytechnic Institute,** Troy, NY USA
Qualified PhD Student, Computer Science, August 2005 – August 2009
97 credits Computer Science coursework completed
Area of Study: Computer Vision Cumulative GPA: 3.95/4.0
M.S., Computer Science, expected graduation date: August 2009
Area of Study: Computer Vision Cumulative GPA: 3.95/4.0
University of Wisconsin – La Crosse, La Crosse, WI USA
B.S., Computer Science and Archaeology, May 2005
Highest Honors GPA: 3.97/4.0

EXPERIENCE **Rensselaer Polytechnic Institute,** Troy, NY USA
Research Assistant **June 2006 to present**
3D to 2D Registration: Developed an algorithm to align 2D images to a 3D model. The algorithm begins with a simple transformation model, and a small region where the transformation model is accurate. From this initialization, the algorithm iteratively grows the region along the embedded 2D surface using the covariance of the transformation model to control the rate. The algorithm also uses model selection to trade off stability and accuracy. Decision criteria is used evaluate the correctness and stability of the final transformation.
Image Guided Hole-filling: Developed an algorithm to fill-in holes in LiDAR data using a single image. The algorithm based on work done in 2D image inpainting and image analogies. First, the algorithm creates a data set of image patch/3D geometry pairs from the non-occluded parts of the LiDAR scan. Using this data set, the algorithm iteratively fills-in user selected holes with high-detail 3D geometry guided by the image evidence.
Teaching Assistant for Computer Science II **September 2005 to May 2006**
Computer Science II is an undergraduate course in elementary data structures and their use in programming. Ran two weekly lab section consisting of 20-30 students. Managed undergraduate teaching assistants. Developed grading scripts for compiling and running programming assignments and emailing grades.
University of Wisconsin – La Crosse, La Crosse, WI USA
Student Instructor **September 2004 to March 2005**
Organized and lead two weekly study sessions and graded homework assignments
Juda Public School, Juda, WI USA
Assistant System Administrator **2001 to 2003**
Refurbished donated computers. Repaired broken computers. Set up new computer labs.

TECHNICAL SKILLS Programming: C, C++, Java, BASH, Matlab
Tools/Applications: \LaTeX , CMake, VxL, Valgrind, Microsoft Office, and other common productivity packages for Windows, OS X, and Linux platforms
Operating Systems: Linux, Apple OS X, Microsoft Windows XP/2000

PUBLICATIONS	<p>J. Becker, C. V. Stewart, R. J. Radke, “LiDAR Inpainting from a Single Image”, Proceedings of the International Workshop on 3-D Digital Imaging and Modeling (3DIM), 2009.</p> <p>G. Yang, J. Becker, C. V. Stewart, “Estimating the Location of a Camera with Respect to a 3D Model”, Proceedings of the International Conference on Recent Advances in 3-D Digital Imaging and Modeling (3DIM), 2007.</p> <p>J. Becker, “ArcImage: A Computer System for Generating Archaeological Floor Plans and Profile Walls”, UW-La Crosse Journal of Undergraduate Research, Volume VII, 2004.</p>
PRESENTATIONS	<p>A poster presentation on “LiDAR Inpainting from a Single Image” at the International Workshop on 3-D Digital Imaging and Modeling (October 2009)</p> <p>An oral presentation on my undergraduate research project ArcImage/ArcWorld at the Seven Rivers Undergraduate Research Symposium (Received Outstanding Student Presentation) (November 2004) and the 19th National Conference on Undergraduate Research (April 2005)</p> <p>Presented a poster on ArcImage/ArcWorld at Day of Celebration in the College of Science and Allied Health at UW–La Crosse (September 2004)</p>
AWARDS	<p>American FFA Degree 2002</p> <p>SAE (Supervised Agricultural Experience) Projects:</p> <ul style="list-style-type: none"> • Emergent Technology • Dairy Placement • Dairy Entrepreneurship <p>University of Wisconsin – La Crosse</p> <ul style="list-style-type: none"> • Dean’s List, 2001–2005 • Academic Excellence Scholarship, 2001–2005 • Upsilon Pi Epsilon, 2004–2005 • Golden Key National Honor Society, 2004–2005 • College of Science and Allied Health Deans’ Distinguished Undergraduate Research Fellowship, Summer 2004
ACTIVITIES AND LEADERSHIP	<p>Rensselaer Polytechnic Institute</p> <ul style="list-style-type: none"> • Student member of the Graduate Curriculum Committee • Presented a graduate students perspective at Department of Computer Science External Review • Recruiting activities for prospective graduate students • Set-up and clean-up at department Colloquia, Seminars, and Mixers
PROFESSIONAL ORGANIZATIONS	<p>Student member of the ACM</p> <p>Student member of the IEEE</p>
CITIZENSHIP	<p>USA</p>
REFERENCES	<p>Available on request.</p>
ARCHAEOLOGY RESEARCH EXPERIENCE	<p>Bipolar Lithic Tool Production</p> <p>Researched material produced by hitting the source material between two rocks. The goal was to find a pattern that could be looked for during excavation to determine if bipolar tool production took place.</p> <p>Oneota Bone Tool Classification System</p> <p>Created a system to be used in documenting the Oneota culture’s bone tool assemblage from an archaeological site. The system allows for consistency between excavations.</p>