CURRICULUM VITAE
William Joseph Beksi

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Academic Rank

Assistant Professor of Computer Science and Engineering
Director of the Robotic Vision Laboratory
University of Texas at Arlington

Education

- **University of Minnesota, Twin Cities**, Minneapolis, MN
  Ph.D., Computer Science, 2018
  M.S., Computer Science, 2016
  Minor in Mathematics
  Advisor: Nikolaos Papanikolopoulos
- **National Taiwan Normal University**, Taipei, Taiwan
  Chinese Language and Cultural Studies, Mandarin Training Center, 2003
- **Stevens Institute of Technology**, Hoboken, NJ
  B.S., Mathematics and Computer Science, 2002

Academic Employment

- Assistant Professor. Department of Computer Science and Engineering,
  University of Texas at Arlington (September 2018 -)
- Research Assistant. Center for Distributed Robotics,
  University of Minnesota (January 2012 - September 2018)

Industry Employment

- Robotics Engineer. iRobot, Technology Organization,
  Bedford, MA (Summer 2017)
- Consulting Software Engineer. Projected Image Planogram System (PIPS),
  Wayzata, MN (2016 -)
- Software Engineer. Index Engines,
  Holmdel, NJ (2006 - 2010)
- Research and Development Engineer. Setabox Technology,
  Taipei, Taiwan (2003 - 2006)

Membership in Professional Organizations

- The Institute for Electrical and Electronics Engineers (IEEE), Member.

Honors and Awards

Nvidia Corporation

- NVIDIA Jetson Nano 2GB Developer Kit Grant Program (2021)

University of Texas at Arlington

- University of Texas System Rising STARs (2018)

University of Minnesota

- UMII MnDRIVE Ph.D. Fellowship (2018)

Contributions to Research

External Research Grants (Current)

1. An Adaptable, Cost-Effective, Real-Time 3D Vision System for Advanced Manufacturing
   U.S. Air Force, Advanced Manufacturing and Sustainment Technologies and Processes (AF21A-TCSO2)
   Role: Lead PI (with Ryan Cousins of krtkl)
   Amount: $150,000. Period: November 2021 - May 2022
2. CRII: RI: Topological Methods for Robotic Perception
   National Science Foundation
   Role: Sole PI
   Amount: $175,000. Period: April 2020 - March 2022
   - NSF REU Supplement. Amount: $16,000. Period: 2020 - 2022

Internal Research Grants

1. An Immersive Teleoperation System for Robot Navigation
   University of Texas at Arlington Research Experiences for Undergraduates Program
   Role: Sole PI
   Amount: $2,000. Period: 2021 - 2022
2. Vision-Based Collision Avoidance for Unmanned Aerial Vehicles
   University of Texas at Arlington Research Enhancement Program
   Role: Lead PI (with Animesh Chakravarthy)
   Amount: $15,000. Period: June 2020 - August 2021

Publications

Publication details are available at `http://ranger.uta.edu/ wjbeksi/`

Journal Publications

Note: My lab members are marked with *.

J2. W.J. Beksi and N. Papanikolopoulos. A Topology-based Descriptor for 3D Point Cloud Modeling: Theory and Experiments, *Image and Vision Computing*, 88, pp. 84-95, 2019.

J1. D. Fehr, W.J. Beksi, D. Zermas and N. Papanikolopoulos. Covariance Based Point Cloud Descriptors for Object Detection and Recognition, *Computer Vision and Image Understanding*, 142, pp. 80-93, 2016.

Conference Proceedings (Refereed)

Note: The presenter is underlined.

C19. N.B. Gutierrez* and W.J. Beksi. Thermal Image Super-Resolution Using Second-Order Channel Attention with Varying Receptive Fields, *International Conference on Computer Vision Systems (ICVS)*, virtual event, pp. 3-13, 2021. **Best Conference Paper Award Finalist**.

C18. M. Davoodi, J.M. Cloud*, A. Iqbal, W.J. Beksi and N.R. Gans. Safe Human-Robot Coetaneousness Through Model Predictive Control Barrier Functions and Motion Distributions, *Modeling, Estimation, and Control Conference (MECC)*, Austin, USA, 2021.

C17. Z. Lyu*, N.B. Gutierrez* and W.J. Beksi. An Uncertainty Estimation Framework for Probabilistic Object Detection, *IEEE International Conference on Automation Science and Engineering (CASE)*, Lyon, France, pp. 1441-1446, 2021.

C16. M. Davoodi, A. Iqbal, J.M. Cloud*, W.J. Beksi and N.R. Gans. Probabilistic Movement Primitive Control via Control Barrier Functions, *IEEE International Conference on Automation Science and Engineering (CASE)*, Lyon, France, pp. 697-703, 2021. **Best Conference Paper Award Finalist**.

C15. P. Karmokar*, K. Dhal, W.J. Beksi and A. Chakravarthy. Vision-Based Guidance for Tracking Dynamic Objects, *International Conference on Unmanned Aircraft Systems (ICUAS)*, Athens, Greece, pp. 1106-1115, 2021.

C14. R.E. Rivadeneira, A.D. Sappa, B.X. Vintimilla, S. Nathan, P. Kansal, A. Mehri, P.B. Ardakani, A. Dalal, A. Akula, D. Sharma, S. Pandey, B. Kumar, J. Yao, R. Wu, K. Feng, N. Li, Y. Zhao, H. Patel, V. Chudasama, K. Prajapati, A. Sarvaiya, K.P. Upla, K. Raja, R. Ramachandra, C. Busch, F. Almasri, T. Vandamme, O. Debeir, N.B. Gutierrez*, Q.H. Nguyen* and W.J. Beksi. Thermal Image Super-Resolution Challenge - PBVS 2021, *17th IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS)*, virtual event, pp. 4359-4367, 2021.

C13. C. Collander*, W.J. Beksi and M. Huber. Learning the Next Best View for 3D Point Clouds via Topological Features, *IEEE International Conference on Robotics and Automation (ICRA)*, Xi'an, China, 2021.

C12. M.S. Arshad* and W.J. Beksi. A Progressive Conditional Generative Adversarial Network for Generating Dense and Colored 3D Point Clouds, *International Conference on 3D Vision (3DV)*, virtual event, pp. 712-722, 2020.

C11. Z. Lyu*, N. Gutierrez*, A. Rajguru* and W.J. Beksi. Probabilistic Object Detection via Deep Ensembles, *Beyond mAP: Reassessing the Evaluation of Object Detectors, European Conference on Computer Vision (ECCV) Workshops*, Glasgow, UK, pp. 67-75, 2020.

C10. R.E. Rivadeneira, A.D. Sappa, B.X. Vintimilla, L. Guo, J. Hou, A. Merhi, P. Behjati, A.H. Patel, V. Chudasama, K. Prajapati, K.P. Upla, R. Ramachandra, K. Raja, C. Busch, F. Almasri, O. Debeir, S. Nathan, P. Kansal, N. Gutierrez*, B. Mojra* and W.J. Beksi. Thermal Image Super-Resolution Challenge - PBVS 2020, *16th IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS)*, Seattle, USA, pp. 96-97, 2020.

C9. A. Rajguru*, C. Collander* and W.J. Beksi. Camera-Based Adaptive Trajectory Guidance via Neural Networks, *International Conference on Mechatronics and Robotics Engineering (ICMRE)*, Barcelona, Spain, pp. 155-159, 2020. **Best Presentation Award**.

C8. W.J. Beksi and N. Papanikolopoulos. Signature of Topologically Persistent Points for 3D Point Cloud Description, *IEEE International Conference on Robotics and Automation (ICRA)*, Brisbane, Australia, pp. 3229-3234, 2018.

C7. W.J. Beksi and N. Papanikolopoulos. 3D Region Segmentation Using Topological Persistence, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Daejeon, Korea, pp. 1079-1084, 2016.

C6. W.J. Beksi and N. Papanikolopoulos. 3D Point Cloud Segmentation Using Topological Persistence, *IEEE International Conference on Robotics and Automation (ICRA)*, Stockholm, Sweden, pp. 5046-5051, 2016.

C5. W.J. Beksi, J. Spruth and N. Papanikolopoulos. CORE: A Cloud-Based Object Recognition Engine for Robotics, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, pp. 4512-4517, 2015.

C4. W.J. Beksi and N. Papanikolopoulos. Object Classification Using Dictionary Learning and RGB-D Covariance Descriptors, *IEEE International Conference on Robotics and Automation (ICRA)*, Seattle, USA, pp. 1880-1885, 2015.

C3. W.J. Beksi and N. Papanikolopoulos. Point Cloud Culling for Robot Vision Tasks Under Communication Constraints, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Chicago, USA, pp. 3747-3752, 2014.

C2. D. Fehr, W.J. Beksi, D. Zermas and N. Papanikolopoulos. Occlusion Alleviation through Motion Using a Mobile Robot, *IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, pp. 3179-3184, 2014.

C1. D. Fehr, W.J. Beksi, D. Zermas and N. Papanikolopoulos. RGB-D Object Classification Using Covariance Descriptors, *IEEE International Conference on Robotics and Automation (ICRA)*, Hong Kong, China, pp. 5467-5472, 2014.

Poster Presentations (Refereed)

P3. N.B. Gutierrez* and W.J. Beksi. Varying Receptive Fields for Thermal Image Super-Resolution, *TACC Symposium for Texas Researchers (TACCSTER)*, Austin, USA, 2021.

P2. M.S. Arshad* and W.J. Beksi. Synthesizing Dense and Colored 3D Point Clouds for Training Deep Neural Networks, *TACC Symposium for Texas Researchers (TACCSTER)*, Austin, USA, 2020.

P1. M.S. Arshad* and W.J. Beksi. 3D Scene Generation via Unsupervised Object Synthesis, *TACC Symposium for Texas Researchers (TACCSTER)*, Austin, USA, 2019.

Selected Colloquia and Invited Talks

- University of Texas at Arlington Research Institute (UTARI) Seminar, November 2019
- Data Science Seminar, University of Texas at Arlington, May 2019
- Workshop on Emerging Topological Techniques in Robotics, International Conference on Robotics and Automation (ICRA), May 2016

Contributions to Teaching

Classroom Teaching

University of Texas at Arlington

- CSE 6367: Computer Vision, Spring 2021 (Enrollment: 25)
- CSE 4308/5360: Artificial Intelligence I, Fall 2020 (Enrollment: 32)
- CSE 6367: Computer Vision, Spring 2020 (Enrollment: 16)
- CSE 4308/5360: Artificial Intelligence I, Fall 2019 (Enrollment: 50)

- CSE 6367: Computer Vision, Spring 2019 (Enrollment: 36)
- CSE 4308/5360: Artificial Intelligence I, Fall 2018 (Enrollment: 62)

University of Minnesota

- CSci 4041: Algorithms and Data Structures, Fall 2016, (Teaching Assistant)
- CSci 5561: Computer Vision, Spring 2018, (Teaching Assistant)
- CSci 5551: Introduction to Intelligent Robotic Systems, Fall 2015, (Teaching Assistant)
- CSci 4141H: Honors Algorithms and Data Structures, Fall 2014, (Teaching Assistant)
- CSci 4511W: Artificial Intelligence, Spring 2014, (Teaching Assistant)
- CSci 5511: Artificial Intelligence I, Fall 2013, (Teaching Assistant)

Advising

Ph.D. Advisees (current)

- Mohammad Samiul Arshad
- Joseph Cloud
- Christopher Collander (co-advisor: Manfred Huber)
- Nolan Gutierrez
- Pritam Karmokar
- Zongyao Lyu
- Md Ahmed Al Muzaddid
- Quan Nguyen

Ph.D. Thesis Committee Member

- Brian Cook: Department of Computer Science and Engineering, University of Texas at Arlington (Advisor: Manfred Huber)

Contributions to Service

Professional Contributions

Leadership Roles

- Conference Session Chair
  - "Stereo Vision Applications" at ICRA 2021
- Faculty Chair: "Space Robotics for In-Situ Resource Utilization Needs, Challenges, and Approaches," IEEE/RSJ International Conference on Intelligent Robots and Systems, 2020.

Editorial Boards

- Associate Editor: International Conference on Ubiquitous Robots (2020, 2021)

Professional Service

- Member of the Standard for Measuring Robot Agility (IEEE P2940) working group
- Proposal Reviewer and Panelist for the National Science Foundation (2020, 2021)
- Reviewer:

  ACM Transactions on Sensor Networks; Autonomous Robots; Computer Vision and Image Understanding; Graphical Models; IEEE Conference on Computer Vision and Pattern Recognition; IEEE International Conference on Computer Vision; IEEE International Conference on Robotics and Automation; IEEE/RSJ International Conference on Intelligent Robots and Systems; IEEE International Conference on Automation Science and Engineering; IEEE Robotics and Automation Letters; IEEE Transactions on Automation Science and Engineering; IEEE Transactions on Intelligent Transportation Systems; IEEE Transactions on Robotics; Image and Vision Computing; Machine Vision and Applications; Robotics and Autonomous Systems; Modeling, Estimation and Control Conference;

Departmental Service

2021

- Industry Outreach Committee

2020

- Broadening Participation in Computing Committee

2018 - 2020

- Faculty Search Committee
- Ph.D. Admissions Committee