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Areas of Expertise

Computer Vision, Deep Learning, Remote Sensing, Medical Imaging, Multimodal Integration

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1 Education

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|-----------|--|------------------------------------|
| 2005–2010 | Ph.D. in Computer Science Adviser: Robert Pless, Ph.D. Thesis: Calibrating and Using the Global Network of Outdoor Webcams | Washington University in St. Louis |
| 1995–1999 | B.S. in Computer Science (Minor in Mathematics) <i>Summa Cum Laude</i> with Honors | University of Missouri |

2 Appointments and Affiliations

Active

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|---|--|
| Professor (with Tenure) 2022– | Dept. of Computer Science & Engineering, Washington University <i>St. Louis, MO</i> |
| Affiliated Faculty 2022– | Division of Computational & Data Sciences, Washington University <i>St. Louis, MO</i> |
| Affiliated Faculty 2022– | Imaging Science Program, Washington University <i>St. Louis, MO</i> |

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|---|---|
| Affiliated Faculty | Electrical and Systems Engineering, Washington University <i>St. Louis, MO</i> |
| 2023– | |
| Affiliated Faculty | AI for Health Institute, Washington University <i>St. Louis, MO</i> |
| 2023– | |
| Associate Faculty | Taylor Geospatial Institute <i>St. Louis, MO</i> |
| 2022– | |
| Faculty Scholar | Center for the Environment, Washington University <i>St. Louis, MO</i> |
| 2023– | |
| Biodiversity Fellow | Living Earth Collaborative <i>St. Louis, MO</i> |
| 2022– | |
| Technical Consultant / Owner / Founder | Multidomain Vision Research, LLC <i>St. Louis, MO</i> |
| 2019–present | |

Prior

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|--|---|
| Professor (with Tenure) | Dept. of Computer Science, University of Kentucky <i>Lexington, KY</i> |
| 2021–2022 | |
| Director of Graduate Studies (Data Science) | Dept. of Computer Science, University of Kentucky <i>Lexington, KY</i> |
| 2020–2022 | |
| Member | Institute for Biomedical Informatics, University of Kentucky <i>Lexington, KY</i> |
| 2017–2022 | |
| Associate Professor (with Tenure) | Dept. of Computer Science, University of Kentucky <i>Lexington, KY</i> |
| 2016–2021 | |
| Co-Department Chair (interim) | Dept. of Computer Science, University of Kentucky <i>Lexington, KY</i> |
| 2019–2020 | |
| Affiliated Faculty | Center for Visualization and Virtual Environments, University of Kentucky <i>Lexington, KY</i> |
| 2010–2019 | |
| Visiting Research Scientist (sabbatical) | Orbital Insight, Inc. <i>Mountain View, CA</i> |
| 2017–2018 | |
| Assistant Professor | Dept. of Computer Science, University of Kentucky <i>Lexington, KY</i> |
| 2010–2016 | |
| Computer Vision Research Intern | ObjectVideo, Inc. <i>Reston, VA</i> |
| 2008 | |
| Graduate Research Assistant | Dept. of Computer Science & Engineering, Washington University <i>St. Louis, MO</i> |
| 2005–2010 | |

3 Awards

- Best Paper Award (out of 75 valid submissions) [EarthVision Workshop 2024 at IEEE/CVF Computer Vision and Pattern Recognition (CVPR)]
- Highlighted Reviewer Recognition (top 8%) [ICLR 2022]
- Outstanding Reviewer Recognition [BMVC 2021]

- Outstanding Reviewer Recognition (top 10%) [NeurIPS 2020]
- Outstanding Reviewer Recognition [ICCV 2019]
- University of Kentucky, College of Engineering Dean's Award for Excellence in Research [2018]
- Google Faculty Research Award [2018]
- Outstanding Reviewer Recognition [CVPR 2017]
- National Science Foundation CAREER Award [2016]
- Google Faculty Research Award [2016]
- Best Student Paper Award at Applied Imagery Pattern Recognition [2009]
- Ph.D. Forum Prize at the ACM/IEEE International Conference on Distributed Smart Cameras [2009]
- Best Talk Award for the Doctoral Student Seminar, Department of Computer Science, the Washington University in St. Louis, [Fall 2006]

4 Publications

Preprints

- [1] S. Sastry, S. Khanal, A. Dhakal, J. Lin, D. Cher, P. Jarosz, and N. Jacobs, *ProM3E: Probabilistic masked multimodal embedding model for ecology*, Nov. 2025. arXiv: [2511.02946 \[cs.CV\]](#).
- [2] S. Khanal, S. Sastry, A. Dhakal, A. Ahmad, and N. Jacobs, *Sat2Sound: A unified framework for zero-shot soundscape mapping*, May 2025. arXiv: [2505.13777 \[cs.CV\]](#).
- [3] Z. Xiong, W. Xiong, J. Shi, H. Zhang, Y. Song, and N. Jacobs, *GroundingBooth: Grounding text-to-image customization*, Sep. 2024. arXiv: [2409.08520 \[cs.CV\]](#).
- [4] F. Qiao, Z. Xiong, X. Zhu, Y. Ma, Q. He, and N. Jacobs, *MCPDepth: omnidirectional depth estimation via stereo matching from multi-cylindrical panoramas*, Aug. 2024. arXiv: [2408.01653 \[cs.CV\]](#).

Refereed Conference Papers

- [1] D. Cher, B. Wei, S. Sastry, and N. Jacobs, “Vectorsynth: Fine-grained satellite image synthesis with structured semantics,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Mar. 2026. arXiv: [2511.07744 \[cs.CV\]](#).
- [2] A. Wollam, K. Ashley, M. Shugaev, O. Arend, I. Y. Semenov, H. Dashtestani, S. Ravi, and N. Jacobs, “Towards unconstrained cross-view pose estimation,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Mar. 2026.
- [3] A. Elallaf, N. Jacobs, X. Ye, M. Chen, and G. Liang, “Beta distribution learning for reliable roadway crash risk assessment,” in *Association for the Advancement of Artificial Intelligence (AAAI)*, Jan. 2026. arXiv: [2511.04886 \[cs.CV\]](#).
- [4] E. Xing, A. Stylianou, R. Pless, and N. Jacobs, “QuARI: Query adaptive retrieval improvement,” in *Neural Information Processing Systems (NeurIPS)*, vol. 2505.21647, Dec. 2025. arXiv: [2505.21647 \[cs.CV\]](#).
- [5] F. Qiao, Z. Xiong, E. Xing, and N. Jacobs, “Towards open-world generation of stereo images and unsupervised matching,” in *IEEE International Conference on Computer Vision (ICCV)*, Oct. 2025. arXiv: [2503.12720 \[cs.CV\]](#).

- [6] S. Sastry, A. Dhakal, E. Xing, S. Khanal, and N. Jacobs, “Global and local entailment learning for natural world imagery,” in *IEEE International Conference on Computer Vision (ICCV)*, vol. 2506.21476, Oct. 2025. arXiv: [2506.21476 \[cs.CV\]](https://arxiv.org/abs/2506.21476).
- [7] A. Dhakal, S. Sastry, S. Khanal, A. Ahmad, E. Xing, and N. Jacobs, “RANGE: Retrieval augmented neural fields for multi-resolution geo-embeddings,” in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, Jun. 2025. arXiv: [2502.19781 \[cs.CV\]](https://arxiv.org/abs/2502.19781).
- [8] E. Xing, P. Kolouju, R. Pless, A. Stylianou, and N. Jacobs, “ConText-CIR: Learning from concepts in text for composed image retrieval,” in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, Jun. 2025. arXiv: [2505.20764 \[cs.CV\]](https://arxiv.org/abs/2505.20764).
- [9] H. Kerner, S. Chaudhari, A. Ghosh, C. Robinson, A. Ahmad, E. Choi, N. Jacobs, C. Holmes, M. Mohr, R. Dodhia, J. M. L. Ferres, and J. Marcus, “Fields of The World: A machine learning benchmark dataset for global agricultural field boundary segmentation,” in *Association for the Advancement of Artificial Intelligence (AAAI)*, vol. 2409.16252, Feb. 2025. arXiv: [2409.16252 \[cs.CV\]](https://arxiv.org/abs/2409.16252).
- [10] A. Sarkar, A. DiChristofano, S. Das, P. Fowler, N. Jacobs, and Y. Vorobeychik, “Active geospatial search for efficient tenant eviction outreach,” in *Association for the Advancement of Artificial Intelligence (AAAI)*, Feb. 2025. arXiv: [2412.17854 \[cs.LG\]](https://arxiv.org/abs/2412.17854).
- [11] S. Sastry, S. Khanal, A. Dhakal, A. Ahmad, and N. Jacobs, “TaxaBind: A unified embedding space for ecological applications,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Feb. 2025. arXiv: [2411.00683 \[cs.CV\]](https://arxiv.org/abs/2411.00683).
- [12] M. Lanier, Y. Xu, N. Jacobs, C. Zhang, and Y. Vorobeychik, “Learning interpretable policies in hindsight-observable POMDPs through partially supervised reinforcement learning,” in *IEEE International Conference on Machine Learning and Applications*, Dec. 2024. arXiv: [2402.09290 \[cs.LG\]](https://arxiv.org/abs/2402.09290).
- [13] A. Sarkar, S. Sastry, A. Pirinen, C. Zhang, N. Jacobs, and Y. Vorobeychik, “GOMAA-Geo: Goal modality agnostic active geo-localization,” in *Neural Information Processing Systems (NeurIPS)*, Dec. 2024. arXiv: [2406.01917 \[cs.CV\]](https://arxiv.org/abs/2406.01917).
- [14] S. Khanal, E. Xing, S. Sastry, A. Dhakal, Z. Xiong, A. Ahmad, and N. Jacobs, “PSM: Learning probabilistic embeddings for multi-scale zero-shot soundscape mapping,” in *ACM Multimedia*, Oct. 2024. DOI: [10.1145/3664647.3681620](https://doi.org/10.1145/3664647.3681620). arXiv: [2408.07050 \[cs.CV\]](https://arxiv.org/abs/2408.07050).
- [15] O. Skean, A. Dhakal, N. Jacobs, and L. G. S. Giraldo, “FroSSL: Frobenius norm minimization for self-supervised learning,” in *European Conference on Computer Vision (ECCV)*, Oct. 2024. arXiv: [2310.02903 \[cs.LG\]](https://arxiv.org/abs/2310.02903).
- [16] A. Sarkar, A. DiChristofano, S. Das, P. Fowler, N. Jacobs, and Y. Vorobeychik, “Geospatial active search for preventing evictions,” in *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2024.
- [17] C. Greenwell, M. Leotta, J. Crall, N. Jacobs, M. Purri, K. Dana, A. Hadzic, and S. Workman, “Watch: Wide-area terrestrial change hypercube,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Jan. 2024.
- [18] A. Sarkar, M. Lanier, S. Alfeld, J. Feng, R. Garnett, N. Jacobs, and Y. Vorobeychik, “A visual active search framework for geospatial exploration,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Jan. 2024.
- [19] S. Sastry, S. Khanal, A. Dhakal, D. Huang, and N. Jacobs, “BirdSat: Cross-view contrastive masked autoencoders for bird species classification and mapping,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Jan. 2024.
- [20] M. Shugaev, I. Semenov, K. Ashley, M. Klaczynski, N. Cuntoor, M. W. Lee, and N. Jacobs, “ArcGeo: Localizing limited field-of-view images using cross-view matching,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Jan. 2024.
- [21] A. Sarkar, N. Jacobs, and Y. Vorobeychik, “A partially-supervised reinforcement learning framework for visual active search,” in *Neural Information Processing Systems (NeurIPS)*, Dec. 2023.

- [22] S. Khanal, S. Sastry, A. Dhakal, and N. Jacobs, “Learning tri-modal embeddings for zero-shot soundscape mapping,” in *British Machine Vision Conference (BMVC)*, Nov. 2023.
- [23] Z. Xiong, F. Qiao, Y. Zhang, and N. Jacobs, “StereoFlowGAN: Co-training for stereo and flow with unsupervised domain adaptation,” in *British Machine Vision Conference (BMVC)*, Nov. 2023.
- [24] X. Xing, C. Peng, Y. Zhang, A.-L. Lin, and N. Jacobs, “AssocFormer: Association transformer for multi-label classification,” in *British Machine Vision Conference (BMVC)*, Nov. 2022.
- [25] E. Xing, X. Xing, L. Liu, N. Jacobs, Y. Qu, and G. Liang, “Neural network decision-making criteria consistency analysis via inputs sensitivity,” in *International Conference on Pattern Recognition (ICPR 2022)*, Aug. 2022. DOI: [10.1109/ICPR56361.2022.9956394](https://doi.org/10.1109/ICPR56361.2022.9956394).
- [26] S. Workman, M. U. Rafique, H. Blanton, and N. Jacobs, “Revisiting near/remote sensing with geospatial attention,” in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, Acceptance rate: 25.33%, Jun. 2022. DOI: [10.1109/CVPR52688.2022.00182](https://doi.org/10.1109/CVPR52688.2022.00182).
- [27] X. Xing, G. Liang, Y. Zhang, S. Khanal, A.-L. Lin, and N. Jacobs, “ADViT: Vision transformer on multi-modality pet images for alzheimer disease diagnosis,” in *IEEE International Symposium on Biomedical Imaging (ISBI)*, Mar. 2022. DOI: [10.1109/ISBI52829.2022.9761584](https://doi.org/10.1109/ISBI52829.2022.9761584).
- [28] H. Blanton, S. Workman, and N. Jacobs, “A structure-aware method for direct pose estimation,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Jan. 2022. DOI: [10.1109/WACV51458.2022.00028](https://doi.org/10.1109/WACV51458.2022.00028).
- [29] Y. Zhang, G. Liang, and N. Jacobs, “Dynamic feature alignment for semi-supervised domain adaptation,” in *British Machine Vision Conference (BMVC)*, Nov. 2021.
- [30] G. Liang, X. Xing, L. Liu, Y. Zhang, Q. Ying, A.-L. Lin, and N. Jacobs, “Alzheimer’s disease classification using 2d convolutional neural networks,” in *International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Oct. 2021. DOI: [10.1109/EMBC46164.2021.9629587](https://doi.org/10.1109/EMBC46164.2021.9629587).
- [31] Q. Ying, X. Xing, L. Liu, A.-L. Lin, N. Jacobs, and G. Liang, “Multi-modal data analysis for Alzheimer’s disease diagnosis: An ensemble model using imagery and genetic features,” in *International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Oct. 2021. DOI: [10.1109/EMBC46164.2021.9630174](https://doi.org/10.1109/EMBC46164.2021.9630174).
- [32] Y. Zhang, G. Liang, Y. Su, and N. Jacobs, “Multi-branch attention networks for classifying galaxy clusters,” in *International Conference on Pattern Recognition (ICPR 2020)*, Acceptance rate: 28.47%, Jan. 2021. DOI: [10.1109/ICPR48806.2021.9412498](https://doi.org/10.1109/ICPR48806.2021.9412498).
- [33] G. Liang, Y. Zhang, X. Wang, and N. Jacobs, “Improved trainable calibration method for neural networks,” in *British Machine Vision Conference (BMVC)*, Sep. 2020.
- [34] M. U. Rafique, H. Blanton, N. Snavely, and N. Jacobs, “Generative Appearance Flow: A hybrid approach for outdoor view synthesis,” in *British Machine Vision Conference (BMVC)*, Sep. 2020.
- [35] G. Liang, X. Wang, Y. Zhang, and N. Jacobs, “Weakly-supervised self-training for breast cancer localization,” in *International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, (oral), 2020. DOI: [10.1109/EMBC44109.2020.9176617](https://doi.org/10.1109/EMBC44109.2020.9176617).
- [36] T. Salem, S. Workman, and N. Jacobs, “Learning a dynamic map of visual appearance,” in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Acceptance rate: 25%, 2020. DOI: [10.1109/CVPR42600.2020.01245](https://doi.org/10.1109/CVPR42600.2020.01245).
- [37] S. Workman and N. Jacobs, “Dynamic traffic modeling from overhead imagery,” in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Acceptance rate: 5.7% (oral), 2020. DOI: [10.1109/CVPR42600.2020.01233](https://doi.org/10.1109/CVPR42600.2020.01233).
- [38] Z. Bessinger and N. Jacobs, “A generative model of worldwide facial appearance,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, (oral), 2019. DOI: [10.1109/WACV.2019.00172](https://doi.org/10.1109/WACV.2019.00172).

- [39] G. Liang, S. Fouladvand, J. Zhang, M. A. Brooks, N. Jacobs, and J. Chen, “GANai: Standardizing CT images using generative adversarial network with alternative improvement,” in *IEEE International Conference on Healthcare Informatics (ICHI)*, 2019. DOI: [10.1109/ICHI.2019.8904763](https://doi.org/10.1109/ICHI.2019.8904763).
- [40] G. Liang, X. Wang, Y. Zhang, X. Xing, H. Blanton, T. Salem, and N. Jacobs, “Joint 2d-3d breast cancer classification,” in *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, Acceptance rate: 18% (oral), 2019. DOI: [10.1109/BIBM47256.2019.8983048](https://doi.org/10.1109/BIBM47256.2019.8983048).
- [41] Y. Zhang, X. Wang, H. Blanton, G. Liang, X. Xing, and N. Jacobs, “2d convolutional neural networks for 3d digital breast tomosynthesis classification,” in *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, Acceptance rate: 18% (oral), 2019. DOI: [10.1109/BIBM47256.2019.8983097](https://doi.org/10.1109/BIBM47256.2019.8983097).
- [42] C. Greenwell, S. Workman, and N. Jacobs, “What goes where: Predicting object distributions from above,” in *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, 2018. DOI: [10.1109/IGARSS.2018.8519251](https://doi.org/10.1109/IGARSS.2018.8519251).
- [43] N. Jacobs, A. Kraft, M. U. Rafique, and R. D. Sharma, “A weakly supervised approach for estimating spatial density functions from high-resolution satellite imagery,” in *ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL)*, Acceptance rate: 22.5% (oral), 2018. DOI: [10.1145/3274895.3274934](https://doi.org/10.1145/3274895.3274934).
- [44] D. Jones, J. Bopiah, F. Alghamedy, N. Jacobs, H. Weiss, W. A. D. Jong, and S. Ellingson, “Polypharmacology within the full kinase: A machine learning approach,” in *AMIA Informatics Summit*, 2018.
- [45] R. P. Mihail and N. Jacobs, “Automatic hand skeletal shape estimation from radiographs,” in *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, Acceptance rate: 19.6%, 2018. DOI: [10.1109/BIBM.2018.8621196](https://doi.org/10.1109/BIBM.2018.8621196).
- [46] T. Salem, M. Zhai, S. Workman, and N. Jacobs, “A multimodal approach to mapping soundscapes,” in *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, 2018. DOI: [10.1109/IGARSS.2018.8517977](https://doi.org/10.1109/IGARSS.2018.8517977).
- [47] S. Schulter, M. Zhai, N. Jacobs, and M. Chandraker, “Learning to look around objects for top-view representations of outdoor scenes,” in *European Conference on Computer Vision (ECCV)*, Acceptance rate: 31.8%, 2018. DOI: [10.1007/978-3-030-01267-0_48](https://doi.org/10.1007/978-3-030-01267-0_48).
- [48] W. Song, S. Workman, A. Hadzic, R. Souleyrette, E. Green, M. Chen, X. Zhang, and N. Jacobs, “FARSA: Fully automated roadway safety assessment,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2018. DOI: [10.1109/WACV.2018.00063](https://doi.org/10.1109/WACV.2018.00063).
- [49] M. Zhai, T. Salem, C. Greenwell, S. Workman, R. Pless, and N. Jacobs, “Learning geo-temporal image features,” in *British Machine Vision Conference (BMVC)*, Acceptance rate: 29.5%, 2018.
- [50] N. Vo, N. Jacobs, and J. Hays, “Revisiting IM2GPS in the deep learning era,” in *IEEE International Conference on Computer Vision (ICCV)*, Acceptance rate: 28.9%, 2017. DOI: [10.1109/ICCV.2017.286](https://doi.org/10.1109/ICCV.2017.286).
- [51] S. Workman, R. Souvenir, and N. Jacobs, “Understanding and mapping natural beauty,” in *IEEE International Conference on Computer Vision (ICCV)*, Acceptance rate: 28.9%, 2017. DOI: [10.1109/ICCV.2017.596](https://doi.org/10.1109/ICCV.2017.596).
- [52] S. Workman, M. Zhai, D. Crandall, and N. Jacobs, “A unified model for near and remote sensing,” in *IEEE International Conference on Computer Vision (ICCV)*, Acceptance rate: 28.9%, 2017. DOI: [10.1109/ICCV.2017.293](https://doi.org/10.1109/ICCV.2017.293).
- [53] M. Zhai, Z. Bessinger, S. Workman, and N. Jacobs, “Predicting ground-level scene layout from aerial imagery,” in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Acceptance rate: 29.2%, 2017. DOI: [10.1109/CVPR.2017.440](https://doi.org/10.1109/CVPR.2017.440).
- [54] X. Zhang, Y. Zhang, E. Han, N. Jacobs, Q. Han, X. Wang, and J. Liu, “Whole mammogram image classification with convolutional neural networks,” in *IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, Acceptance rate: 19%, 2017. DOI: [10.1109/BIBM.2017.8217738](https://doi.org/10.1109/BIBM.2017.8217738).

- [55] R. Baltenberger, M. Zhai, C. Greenwell, S. Workman, and N. Jacobs, “A fast method for estimating transient scene properties,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Acceptance rate: 42.3%, 2016, pp. 1–8. DOI: [10.1109/WACV.2016.7477713](https://doi.org/10.1109/WACV.2016.7477713).
- [56] Z. Bessinger and N. Jacobs, “Quantifying curb appeal,” in *IEEE International Conference on Image Processing (ICIP)*, Acceptance rate: 45%, 2016. DOI: [10.1109/ICIP.2016.7533189](https://doi.org/10.1109/ICIP.2016.7533189).
- [57] Z. Bessinger, C. Stauffer, and N. Jacobs, “Who goes there? Approaches to mapping facial appearance diversity,” in *ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL)*, 2016. DOI: [10.1145/2996913.2996997](https://doi.org/10.1145/2996913.2996997).
- [58] R. P. Mihail, S. Workman, Z. Bessinger, and N. Jacobs, “Sky segmentation in the wild: An empirical study,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Acceptance rate: 42.3%, 2016, pp. 1–6. DOI: [10.1109/WACV.2016.7477637](https://doi.org/10.1109/WACV.2016.7477637).
- [59] T. Salem, S. Workman, M. Zhai, and N. Jacobs, “Analyzing human appearance as a cue for dating images,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Acceptance rate: 42.3%, 2016, pp. 1–8. DOI: [10.1109/WACV.2016.7477678](https://doi.org/10.1109/WACV.2016.7477678).
- [60] S. Workman, M. Zhai, and N. Jacobs, “Horizon lines in the wild,” in *British Machine Vision Conference (BMVC)*, Acceptance rate: 39.4%, 2016.
- [61] M. Zhai, S. Workman, and N. Jacobs, “Camera geo-calibration using an MCMC approach,” in *IEEE International Conference on Image Processing (ICIP)*, Acceptance rate: 45%, 2016. DOI: [10.1109/ICIP.2016.7532905](https://doi.org/10.1109/ICIP.2016.7532905).
- [62] M. Zhai, S. Workman, and N. Jacobs, “Detecting vanishing points using global image context in a non-Manhattan world,” in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Acceptance rate: 29.9%, 2016. DOI: [10.1109/CVPR.2016.610](https://doi.org/10.1109/CVPR.2016.610).
- [63] M. T. Islam, S. Workman, and N. Jacobs, “Face2GPS: Estimating geographic location from facial features,” in *IEEE International Conference on Image Processing (ICIP)*, Acceptance rate: 45% (overall), 2015. DOI: [10.1109/ICIP.2015.7351072](https://doi.org/10.1109/ICIP.2015.7351072).
- [64] C. Murdock, N. Jacobs, and R. Pless, “Building dynamic cloud maps from the ground up,” in *IEEE International Conference on Computer Vision (ICCV)*, Acceptance rate: 30.3%, 2015, pp. 1–9. DOI: [10.1109/ICCV.2015.85](https://doi.org/10.1109/ICCV.2015.85).
- [65] S. Workman, C. Greenwell, M. Zhai, R. Baltenberger, and N. Jacobs, “DeepFocal: A method for direct focal length estimation,” in *IEEE International Conference on Image Processing (ICIP)*, Acceptance rate: 45% (overall), 2015. DOI: [10.1109/ICIP.2015.7351024](https://doi.org/10.1109/ICIP.2015.7351024).
- [66] S. Workman, R. Souvenir, and N. Jacobs, “Wide-area image geolocation with aerial reference imagery,” in *IEEE International Conference on Computer Vision (ICCV)*, Acceptance rate: 30.3%, 2015, pp. 1–9. DOI: [10.1109/ICCV.2015.451](https://doi.org/10.1109/ICCV.2015.451).
- [67] M. T. Islam, S. Workman, H. Wu, R. Souvenir, and N. Jacobs, “Exploring the geo-dependence of human face appearance,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Acceptance rate: 40%, 2014, pp. 1042–1049. DOI: [10.1109/WACV.2014.6835989](https://doi.org/10.1109/WACV.2014.6835989).
- [68] N. Jacobs, J. King, D. Bowers, and R. Souvenir, “Estimating cloud maps from outdoor image sequences,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Acceptance rate: 40%, 2014, pp. 961–968. DOI: [10.1109/WACV.2014.6836000](https://doi.org/10.1109/WACV.2014.6836000).
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Abstracts

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- [2] R. O. Balogun, T. Chakraborty, G. Muhamenayo, H. R. Kerner, A. M. Tarano, Z. Fang, N. Jacobs, S. Khanal, R. Abedi, and L. D. Estes, “Combining open labeled datasets with varying domains to improve large-scale agricultural field boundary delineation,” in *American Geophysical Union (AGU) Fall Meeting Abstracts*, Dec. 2025.
- [3] G. Muhamenayo, Z. Fang, S. Khanal, A. Wollam, I. Corley, C. Robinson, M. Mohr, C. Holmes, J. Marcus, L. D. Estes, N. Jacobs, A. Tárano, and H. R. Kerner, “Global field boundary delineation model zoo and tooling,” in *American Geophysical Union (AGU) Fall Meeting Abstracts*, Dec. 2025.
- [4] S. Shen, A. van Donkelaar, N. Jacobs, C. Li, and R. Martin, “Enhancing estimation of daily 1-km resolution fine particulate matter concentrations for north america with deep learning from geophysical a priori information,” in *American Geophysical Union (AGU) Fall Meeting Abstracts*, Dec. 2025.
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- [36] J. Zhu, A. M. Nolte, N. Jacobs, and M. Ye, “Incorporating machine learning with LiDAR for delineating sinkholes,” in *Kentucky Water Resources Annual Symposium*, 2019.
- [37] D. Jones, N. Jacobs, and S. Ellingson, “Learning deep feature representations for kinase polypharmacology,” in *ACM Richard Tapia Celebration of Diversity in Computing Conference*, 2018.
- [38] G. Liang, X. Wang, and N. Jacobs, “Evaluating the publicly available mammography datasets for deep learning model training,” in *SBI/ACR Breast Imaging Symposium*, 2018.
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Datasets

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- [6] T. Salem, S. Workman, M. Zhai, and N. Jacobs, *Cross-View Time (CVT)*, <https://mvrl.github.io/CVT>.
- [7] T. Salem, S. Workman, M. Zhai, and N. Jacobs, *Face2Year: A large number of images extracted from highschool yearbooks*, <https://mvrl.github.io/Face2Year>.
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- [10] S. Workman, M. Zhai, and N. Jacobs, *Horizon Lines in the Wild (HLW): A large database of images with known horizon-line location*, <http://mvrl.github.io/HLW>.

Patents

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5 Funding

Summary of funding to University of Kentucky as grants, contracts, or unrestricted gifts (Last updated: Nov 23, 2021):

- Total funding: \$10,203,326
 - by role:
 - * PI: \$4,234,003
 - * Co-PI/Co-I: \$5,969,323
 - by source:
 - * Federal: \$9,799,904 (inc. subcontracts on Federal awards)
 - * Industry: \$199,107
 - * Foundation: \$159,000
 - * Internal: \$45,315 (only includes competitively awarded funds)

This excludes a \$28,861,434 NIH CTSA grant, on which I don't deem my contribution essential to the success of this award.

Grants (awarded/active)

1. *Learning-Based Visual Event Demarcation*

PI: **Nathan Jacobs**

Co-PI(s)/Co-I(s): Anderson Rocha (UNICAMP)

Sponsor: Global Incubator Seed Grant (WashU Internal Funding)

Total Award: \$25,000

Duration: 2022–2023

2. *WATCH: Wide Area Terrestrial Change Hypercube*

PI: **Nathan Jacobs**

Sponsor: Kitware / Intelligence Advanced Research Projects Activity (IARPA)

Total Award: \$305,941.48 (Phase 1); \$851,489 (Phase 1–3)

Duration: 2020–2022 (Phase 1); 2020–2024 (Phase 1–3)

3. *Measures of Information via Representation Learning*

PI: Luis Sanchez-Giraldo

Co-PI(s)/Co-I(s): **Nathan Jacobs**

Sponsor: Department of Defense (DEPSCoR)

Total Award: \$582,376

Duration: 2021–2024

4. *GeoSearch: Image-based Geolocation using Rank Aggregated Hash Index (Phase 2, direct)*

PI: **Nathan Jacobs**

Sponsor: Blue Halo / National Geospatial-Intelligence Agency (NGA)

Total Award: \$250,000

Duration: 2021–2023

5. *Spatio-Temporal Association and Curve Kernel Networks (STACKNet)*
PI: **Nathan Jacobs**
Sponsor: Blue Halo / MDA
Total Award: \$483,000 (Phase 1 and 2)
Duration: 2020–2023
6. *Geolocalization Pipeline for Ground Level Images*
PI: **Nathan Jacobs**
Sponsor: Blue Halo / National Geospatial-Intelligence Agency (NGA)
Total Award: \$19,944 (Phase 1), \$249,988 (Phase 2), \$153,261 (Phase 3, Year 1)
Duration: 2018–2022

Grants (completed)

1. *NURI: Semantic Representations for Multi-Viewpoint Multimodal Geolocation*
PI: **Nathan Jacobs**
Sponsor: Johns Hopkins University, Applied Physics Laboratory / National Geospatial-Intelligence Agency (NGA)
Total Award: \$196,000 (base)
Duration: 2020–2022
2. *R01: Ex vivo single molecule tools to analyze membrane receptor dynamics*
PI: Christopher Richards
Co-PI(s)/Co-I(s): Jim Pauly, Ahmed Abdel-Latif, David Heidary, **Nathan Jacobs**
Sponsor: National Institutes of Health (NIH)
Total Award: \$1,510,803
Duration: 2021–2022 (my role ended when I left the University of Kentucky)
3. *UL1: Kentucky Center for Clinical and Translational Science*
PI: Philip A. Kern
Co-PI(s)/Co-I(s): **Nathan Jacobs** and many others
Sponsor: National Institutes of Health (NIH)
Total Award: \$28,893,663
Duration: 2021–2022 (my role ended when I left the University of Kentucky)
4. *CCT: Context and Colorization for Tracking (Phase 2)*
PI: **Nathan Jacobs**
Sponsor: Intelligent Automation Inc. / Defense Advanced Research Projects Agency (DARPA)
Total Award: \$200,000
Duration: 2020–2021
5. *Video to Feature Data Association and Geolocation*
PI: **Nathan Jacobs**
Sponsor: Novateur Research Solutions / National Geospatial-Intelligence Agency (NGA)
Total Award: \$29,503 (Phase 1), \$149,883 (Phase 2)
Duration: 2018–2021
6. *CAREER: Learning and Using Models of Geo-Temporal Appearance*
PI: **Nathan Jacobs**
Sponsor: National Science Foundation (NSF)
Total Award: \$499,426
Duration: 2016–2021

7. *R01: Monomeric G-proteins and Cardioprotection from Heart Failure*
PI: John Satin
Co-PI(s)/Co-I(s): Douglas Andres, Ahmed Abdel-Latif, **Nathan Jacobs**, Peter Kekenes-Huskey
Sponsor: National Institutes of Health (NIH)
Total Award: \$1,575,279
Duration: 2016–2020
8. *Group Travel Grant for the Doctoral Consortium to be Held in Conjunction with IEEE Conference on Computer Vision and Pattern Recognition*
PI: **Nathan Jacobs**
Sponsor: National Science Foundation (NSF)
Total Award: \$22,500
Duration: 2019–2020
9. *DLALA: Deep Learning for Airborne LiDAR Analysis*
PI: **Nathan Jacobs**
Sponsor: Orbital Insight
Total Award: \$104,927
Duration: 2019–2020
10. *Listening to Markets: A Temporal Convolutional Net (TCN) Analysis of Conservatism in Company Reporting*
PI: Dan Stone
Co-PI(s)/Co-I(s): **Nathan Jacobs**, Mark Lauersdorf, Hong Xie
Sponsor: University of Kentucky
Total Award: \$33,315
Duration: 2018–2019
11. *Calibrated Pose Regression Networks*
PI: **Nathan Jacobs**
Sponsor: The Design Knowledge Company / Air Force Research Lab (Wright-Patterson AFB)
Total Award: \$155,700 (Phase 3)
Duration: 2018–2019
12. *Group Travel Grant for the PhD Forum to be Held in Conjunction with IEEE Winter Conference on Applications of Computer Vision*
PI: **Nathan Jacobs**
Sponsor: National Science Foundation (NSF)
Total Award: \$13,625
Duration: 2018–2019
13. *ASER Multi Center Review of Blunt Splenic Trauma: Optimal CT Diagnosis, Characterization*
PI: James Lee (Radiology)
Co-PI(s)/Co-I(s): David Nickels, **Nathan Jacobs**, Emily Slade
Sponsor: American Society of Emergency Radiology
Total Award: \$5,000
Duration: 2018–2019
14. *Mechanism of a Novel Stable Compensatory Cardiac Hypertrophy Model*
PI: Jonathan Satin
Co-PI(s)/Co-I(s): Douglas Andres, **Nathan Jacobs**, Moriel Vandsburger
Sponsor: American Heart Association
Total Award: \$154,000
Duration: 2016–2018

15. *NIP: GeoLookbook: Modeling Worldwide Human Visual Appearance*
PI: Nathan Jacobs
Sponsor: National Geospatial-Intelligence Agency (NGA)
Total Award: \$299,204
Duration: 2014–2018
16. *Crossview ConvNets for Near/Remote Sensing*
PI: Nathan Jacobs
Sponsor: Google
Total Award: \$46,209
Duration: 2016–2017
17. *WALDO: Wide Area Localization of Depicted Objects*
PI: Nathan Jacobs
Sponsor: Object Video / Intelligence Advanced Research Projects Activity (IARPA)
Total Award: \$373,395
Duration: 2012–2016
18. *CSSG: ContextualEyes: A Context-Aware Surveillance System*
PI: Nathan Jacobs
Sponsor: Defense Advanced Research Projects Agency (DARPA)
Total Award: \$743,131
Duration: 2011–2015
19. *Image-Net: Discriminatory Imaging and Network Advancement for Missiles, Aviation, and Space*
PI: Brent Seales
Co-PI(s)/Co-I(s): Ken Calvert, James Griffioen, Jane Hayes, **Nathan Jacobs**, Victor Marek, Thomas Seigler, Suzanne Smith, Miroslaw Truszcynski, Ruigang Yang
Sponsor: United States Army Space and Missile Defense Command / United States Army Forces Strategic Command
Total Award: \$2,092,905
Duration: 2011–2012

Donations

| | |
|---|--------------------------|
| 1. <i>Google Cloud Compute Research Credits</i> | PI: Nathan Jacobs |
| Sponsor: Google | Date: Aug 2018 |
| | Amount/Value: \$5,000 |
| 2. <i>NVIDIA Titan X GPU</i> | PI: Nathan Jacobs |
| Sponsor: NVIDIA | Date: Oct 2016 |
| | Amount/Value: \$778 |
| 3. <i>AWS Research Education Grant</i> | PI: Nathan Jacobs |
| Sponsor: Amazon | Date: Jul 2015 |
| | Amount/Value: \$5,000 |
| 4. <i>NVIDIA Tesla K40 GPU</i> | PI: Nathan Jacobs |
| Sponsor: NVIDIA | Date: Dec 2014 |
| | Amount/Value: \$3,900 |

6 Talks

1. “(Almost) Two Decades of Vision Across Altitudes” (keynote), Oct 2025, Workshop on 3D-VAST From street to space: 3D Vision Across Altitudes (ICCV 2025 Workshop), Honolulu, Hawaii
2. “Learning to Map Anything, Anywhere, Anytime” (keynote), Nov 2023, The International Conference on Digital Image Computing: Techniques and Applications (DICTA), Port Macquarie, Australia

3. “Learning to Map Anything, Anywhere, Anytime” (keynote), Oct 2023, ACM Multimedia Workshop (UAVs in Multimedia: Capturing the World from a New Perspective), Ottawa, Canada
4. “A Cost-Sensitive Approach To Dimensionality Reduction for Multispectral Imagery”, Jul 2023, International Geoscience and Remote Sensing Symposium, Pasadena, CA
5. “Explorations in Self-Supervised Learning for Change Detection”, Jul 2023, International Geoscience and Remote Sensing Symposium, Pasadena, CA
6. “Toward Dynamic Multimodal Remote Sensing: From Buildings and Populations to Soundscapes and Aesthetics”, Apr 2023, Living Earth Collaborative, Washington University, St. Louis, MO
7. “Domain-Inspired Deep Learning for Computer Vision, Remote Sensing, and Medical Imaging”, Oct 2022, Imaging Science Seminar, Washington University, St. Louis, MO
8. “Computer Vision for Multimodal Remote Sensing”, Aug 2022, WashU Geospatial Working Group Research Workshop, Washington University, St. Louis, MO
9. “A Structure-Aware Method for Direct Pose Estimation”, Jan 2022, IEEE Winter Conference on Applications of Computer Vision (WACV), Waikoloa Village, HI
10. Panelist for “Non-Traditional Careers in Computer Science” Nov 2021, ACM-W, University of Kentucky, Lexington, KY
11. “Mapping the Visual World Using Webcams, Cell Phones, and Satellites”, Oct 2021, Washington University in St. Louis, MO
12. “Learning Geo-Temporal Scene Models from Webcams, Cell Phones, and Satellites” (Keynote), Oct 2021, International Workshop on Distributed Smart Cameras, an ICCV Workshop (virtual)
13. “Mapping the Visual World Using Webcams, Cell Phones, and Satellites”, Dec 2020, University of Campinas, Unicamp, Brazil (virtual)
14. “Exploring the Intersection of Localization, Mapping, and Image Understanding” (Keynote), Aug 2020, ECCV Workshop on Long-Term Visual Localization (virtual)
15. “Deep Convolutional Neural Networks: Foundations to Frontiers (a 2-day short course)”, Mar 2020, Brazilian Space Agency (INPE), Sao Jose dos Campos, Brazil
16. “What, Where, and When: Mapping the World Using Webcams, Cell Phones, and Satellites”, Mar 2020, Brazilian Space Agency (INPE), Sao Jose dos Campos, Brazil
17. “Learning to Map Visual Appearance”, Feb 2020, Keeping Current Seminar, University of Kentucky (Computer Science), Lexington, KY
18. “Learning to Map Visual Appearance”, Jan 2020, Wageningen University, Netherlands
19. “What, Where, and When: Mapping the World Using Webcams, Cell Phones, and Satellites”, Nov 2019, University of Kentucky (Forestry), Lexington, KY
20. “Learning to Map the Visual World”, Jul 2019, Wright State University, Dayton, OH
21. “Understanding Places Using Ground-Level and Overhead Views” (Keynote), May 2019, Kentucky Geological Society (Annual Symposium), Lexington, KY
22. “Understanding Places Using Ground-Level and Overhead Views”, Feb 2019, Notre Dame University, South Bend, IN

23. "A Generative Model of Worldwide Facial Appearance" (Keynote), Jan 2019, Workshop on Demographic Variations in Performance of Biometric Algorithms, Waikoloa Village, HI
24. "A Generative Model of Worldwide Facial Appearance", Jan 2019, IEEE Winter Conference on Applications of Computer Vision, Waikoloa Village, HI
25. "A Weakly Supervised Approach for Estimating Spatial Density Functions from High-Resolution Satellite Imagery", Nov 2018, ACM SIGSPATIAL, Seattle, WA
26. "Understanding Places Using Ground-Level and Overhead Views", Oct 2018, Commonwealth Computational Summit, Lexington, KY
27. "GeoLookbook: Modeling Worldwide Human Visual Appearance (Year 4)", Sep 2018, National Academy of Sciences (IC Academic Research Symposium), Washington, DC
28. "Understanding Places Using Ground-Level and Overhead Views", Aug 2018, Oak Ridge National Lab, Oak Ridge, TN
29. "WhatGoesWhere: Predicting Object Distributions from Above", Jul 2018, IGARSS, Valencia, Spain
30. "Building World Models for Situated Training and Planning", May 2018, Air Force Science and Technology 2030 Workshop, Bloomington, IN
31. "Recent Advances in Image Understanding", May 2018, DASC, Lexington, KY
32. "(Tutorial) Recent Advances in Deep Learning: Fusing Overhead and Ground-Level Views for Remote Sensing", April 2018, USGIF Annual Symposium, Tampa, FL
33. "Understanding Places Using Ground-Level and Overhead Views", Feb 2018, CVPR Area Chair Meeting, Toronto, Canada
34. "GeoLookbook: Modeling Worldwide Human Visual Appearance (Year 3)", Sep 2017, National Academy of Sciences (IC Academic Research Symposium), Washington, DC
35. "GPU Accelerated Computer Vision, Remote Sensing, and Machine Learning", Aug 2017, Kentucky Geological Service, Lexington, KY
36. "Fusing Overhead and Ground-Level Imagery to Improve Scene Understanding", Jul 2017, Planet, San Francisco, CA
37. "Learning about When and Where from Imagery", Jun 2017, Orbital Insight, Mountain View, CA
38. "(Tutorial) Recent Advances in Deep Learning: Fusing Overhead and Ground-Level Views for Remote Sensing", Jun 2017, USGIF Annual Symposium, San Antonio, TX
39. "How Computers See People (extended)", May 2017, CCTS Biomedical Informatics Seminar Series, Lexington, KY
40. "Understanding Places Using Ground-Level and Overhead Views", May 2017, Midwest Vision Meeting, Chicago, IL
41. "How Computers See People", Feb 2017, Suds'n'Science Speaker Series, West Sixth Brewing, Lexington, KY
42. "Learning about When and Where from Imagery", Feb 2017, University of Missouri, Department of Computer Science
43. "Localization, Mapping, and Image Understanding", Feb 2017, USGIF Machine Learning Symposium

44. "Deep Convolutional Neural Networks: Concepts and Examples (in Computer Vision)", Nov 2016, University of Kentucky, Society of Industrial and Applied Mathematics
45. "Crossview Convolutional Networks", Oct 2016, Applied Imagery and Pattern Recognition, Washington, D.C.
46. "GeoLookbook: Modeling Worldwide Human Visual Appearance (Year 2)", Sep 2016, National Academy of Sciences (IC Academic Research Symposium), Washington, DC
47. "Deep Convolutional Neural Networks: Concepts and Examples", Jul 2016, University of Kentucky: Systems Biology and Omics Integration Seminar
48. "Crossview Methods for Localization and Mapping", Jun 2016, IEEE CVPR Workshop on "Vision from Satellite to Street" (invited talk)
49. "A Fast Method for Estimating Transient Scene Properties", Mar 2016, Winter Conference on Applications of Computer Vision, Lake Placid, NY
50. "Novel Cues for Geocalibration", Feb 2016, Indiana University, Bloomington, IN
51. "Novel Cues for Camera Geocalibration", Jan 2016, Uber Advanced Technology Center, Pittsburgh, PA
52. "Novel Cues for Geocalibration: Cloudy Days, Rainbows, and More", Oct 2015, Carnegie Mellon University, Pittsburgh, PA
53. "Using Geotagged Internet Imagery to Understand the World", Sep 2015, Université Laval, Quebec City, Canada
54. "face2gps: Estimating Geographic Location from Facial Features", Sep 2015, International Conference on Image Processing, Quebec City, Canada
55. "GeoLookbook: Modeling Worldwide Human Visual Appearance", Sep 2015, National Academy of Sciences (IC Academic Research Symposium), Washington, DC
56. "Exploring the Geo-Dependence of Human Face Appearance", Mar 2014, Winter Conference on Applications of Computer Vision, Steamboat Springs, CO
57. "Estimating Cloudmaps from Outdoor Image Sequences", Mar 2014, Winter Conference on Applications of Computer Vision, Steamboat Springs, CO
58. "Scene Geometry from Several Partly Cloudy Days", Oct 2013, International Conference on Distributed Smart Cameras, Palm Springs, CA
59. "Unlocking the Potential of the Global Network of Outdoor Webcams", Apr 2013, Rochester Institute of Technology
60. "Geo-temporal Computer Vision: Applications to the NGA", Nov 2011, National Geospatial-Intelligence Agency
61. "Geo-temporal Computer Vision: Applications to the Army", Oct 2011, Army Research Lab
62. "Localizing, Calibrating, and Using Thousands of Outdoor Webcams", Feb 2011, University of North Carolina–Charlotte
63. "Using Clouds Shadows to Infer Scene Structure and Camera Calibration", Jun 2010, CVPR, San Francisco, CA
64. "Passive Vision and The Power of Collective Imaging", Apr 2010, Object Video Inc., Reston, VA
65. "Localizing, Calibrating, and Using Thousands of Outdoor Webcams", Apr 2010, University of Kentucky

66. "Time-Lapse Vision: Localizing, Calibrating, and Using Thousands Outdoor Webcams", Apr 2010, Google, Mountain View, CA
67. "Passive Vision and The Power of Collective Imaging", Jan 2010, Google, Mountain View, CA
68. "Incorporating Domain Constraints in Urban Vehicle Tracking", Nov 2010, University of Missouri, Columbia, MO
69. "Compressive Sensing and Differential Image-Motion Estimation", Mar 2010, ICASSP, Dallas, TX
70. "The Global Network of Outdoor Webcams: Properties and Applications ", Nov 2009, ACM GIS, Seattle, WA
71. "Passive Vision: The Global Webcam Imaging Network", Oct 2009, AIPR, Washington, DC
72. "Calibrating and Using the Global Network of Outdoor Webcams", Aug 2009, ICDSC, Italy
73. "Adventures in Archiving and Using Three Years of Webcam Images", Jun 2009, CVPR Workshop on Internet Vision, Miami, FL
74. "Recent Work: Webcams and Grooves", Aug 2009, Object Video, Reston, VA
75. "Location-Specific Models for Tracking", Jan 2008, WMVC, Copper Mountain, CO
76. "Using natural cues to geo-locate and geo-orient distributed cameras", Jan 2008, VISN, Copper Mountain, CO
77. "Foreground Modeling: The Shape of Things That Came", Feb 2007, WMVC, Austin, Texas

7 Service

University Service

- Washington University in St. Louis (2022–present)
 - 2023–present: Director of PhD Admissions, Department of Computer Science & Engineering
 - 2023–present: Faculty Advisor, WashU Robomaster Club
 - 2023–present: Faculty Technology Advisory Committee, James McKelvey School of Engineering
 - 2022–present: Leadership Team, Geospatial Working Group
 - 2022–present: Research Council, Taylor Geospatial Institute
 - 2023–present: Faculty Search Committee, Imaging Science Program
 - 2023–present: Curriculum Committee, Imaging Science Program
 - 2022–present: Faculty Search Committee, Computer Science & Engineering Department
 - 2022–2023: Strategic Planning Steering Committee, James McKelvey School of Engineering
- University of Kentucky (2010–2022)
 - 2021–2022: Institute for Biomedical Informatics: Steering Committee
 - 2019–2022: Computer Science Department: Executive Committee
 - 2019–2022: College of Engineering: Master Planning/Space Committee
 - 2018–2019, 2020–2022: College of Engineering: Research Advisory Committee
 - 2020–2022: College of Engineering: Graduate Studies Team
 - 2013–2017, 2018–2022: Computer Science Department: Faculty Search Committee

- 2020–2021: Computer Science Department: Chair Search Committee
- 2020: College of Engineering: Recruiting Advisory Committee
- 2018–2019: University Senate (Academic Facilities Committee, Technology Committee)
- 2017: Member (Information Technology Task Force for Research Enablement and Outreach)
- 2015–2016: Computer Science Department: ABET Committee
- 2010–2012, 2015–2016: Computer Science Department: Media and Outreach
- 2013: Center for Visualization and Virtual Environment: Director Search Committee
- 2013: Computer Science Department: Chair Search Committee
- 2012–2013: Computer Science Department: Curriculum Development Committee
- 2012–2013, 2015: Engineering Day (oral presentation and/or software demonstration)

Professional Service

- Area Chair:
 - IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) [2018, 2019, 2021, 2023, 2024 (senior), 2025 (lead), 2026 (senior)]
 - European Conference on Computer Vision (ECCV) [2022, 2024 (lead)]
 - IEEE/CVF International Conference on Computer Vision (ICCV) [2023, 2025 (lead)]
 - Conference on Neural Information Processing Systems (NeurIPS) [2024]
 - IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) [2014, 2022, 2023]
- Organizing Committees:
 - Foundational Models Beyond the Visual Spectrum (workshop at IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)) [2026]
 - Industrial/Government Relations Chair: IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) [2024]
 - IEEE/ISPRS Workshop on Large Scale Computer Vision for Remote Sensing Imagery (EARTHVISION) [2019–2023, 2025]
 - Doctoral Consortium Co-Chair: IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) [2017, 2019, 2024, 2025]
 - Doctoral Consortium Chair: IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) [2018, 2022]
 - Video Proceedings Chair: IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) [2015]
 - IEEE Workshop on Motion and Video Computing (WMVC) [2011]
- Guest Editor:
 - ISPRS Journal of Photogrammetry and Remote Sensing [2024], Special Issue “Vision Language Models for Remote Sensing Analysis and Interpretation”
 - IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (J-STARS) [2021], Special Issue “Integrating User Generated Contents for Remote Sensing Applications”
 - Elsevier Computer Vision and Image Understanding (CVIU) [2019], Special Issue “Computer Vision for Remote Sensing”

- Panelist:
 - Roundtable Discussion at 1st Workshop on Computer Vision for Earth Observation (CV4EO) Applications 2024 (Hosted as part of IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2024)
- Session Chair:
 - IEEE International Geoscience and Remote Sensing Symposium (IGARSS) [2020,2023]
 - IEEE/ISPRS Workshop on Large Scale Computer Vision for Remote Sensing Imagery (EARTHVISION) [2019]
 - IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) [2016, 2019, 2022, 2024]
 - IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) [2018, 2024, 2025]
 - IEEE/ACM International Conference on Distributed Smart Cameras [2013]
- Reviewing for Journals:
 - Proceedings of the National Academy of Sciences [2024]
 - IEEE Transactions on Geoscience and Remote Sensing [2020]
 - ISPRS Journal of Photogrammetry and Remote Sensing [2020]
 - IEEE Transactions on Pattern Analysis and Machine Intelligence [2011×2, 2012, 2018, 2019]
 - ISPRS Journal of Photogrammetry and Remote Sensing [2019]
 - IEEE Transactions on Geoscience and Remote Sensing [2017]
 - IEEE Transactions on Multimedia [2011, 2016]
 - Elsevier Computer Vision and Image Understanding [2010, 2013, 2016×2]
 - IEEE Transactions on Computational Imaging [2016]
 - IEEE Journal on Selected Topics in Remote Sensing [2015]
 - Springer Machine Vision and Applications [2014]
 - IEEE Sensors [2014]
 - Elsevier Image and Vision Computing [2013]
 - IEEE Transactions on Circuits and Systems for Video Technology [2007–2011]
 - IEEE Computer Graphics and Applications [2010]
 - IEEE Transactions on Aerospace and Electronic Systems [2010]
 - Elsevier Computers and Electronics in Agriculture [2010]
 - Cartography and Geographic Information Science [2010]
- Program Committee / Reviewer for:
 - Conferences
 - * International Conference on Learning Representations (ICLR) [2022, 2025]
 - * IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) [2021, 2024, 2025]
 - * IEEE International Geoscience and Remote Sensing Symposium (IGARSS) [2020]
 - * British Machine Vision Conference (BMVC) [2020]
 - * IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) [2006–2017, 2020]
 - * European Conference on Computer Vision (ECCV) [2010, 2014, 2020]
 - * Neural Information Processing Systems (NeurIPS) [2010–2012, 2020]

- * AAAI Conference on Artificial Intelligence (AAAI) [2020, 2026 (social impact track)]
- * IEEE/CVF International Conference on Computer Vision (ICCV) [2007, 2009, 2019, 2021]
- * Asian Conference on Computer Vision (ACCV) [2010, 2016]
- * IEEE International Conference on Robotics and Automation (ICRA) [2016]
- * International Conference on Machine Learning (ICML) [2012]
- * IEEE International Conference on Advanced Video and Signal-Based Surveillance (AVSS) [2010]
- Workshops
 - * ICLR Workshop on Machine Learning for Remote Sensing [2023]
 - * IEEE/ISPRS Workshop on Large Scale Computer Vision for Remote Sensing Imagery (EARTHVISION) [2017, 2019, 2020]
 - * CVPR Workshop on Photogrammetric Computer Vision [2019]
 - * CVPR Workshop on DeepGlobe Satellite Challenge [2018]
 - * ACM International Workshop on Geotagging and Its Applications [2013]
 - * ICCV Workshop on Computer Vision for Converging Perspectives [2013]
 - * IEEE Workshop on Applications of Computer Vision [2012–2013]
 - * ECCV Workshop on Visual Analysis and Geo-Localization of Large-Scale Imagery [2012]
 - * ACM Workshop on Geotagging and Its Applications in Multimedia [2012]
 - * IEEE Workshop on Motion and Video Computation [2009–2011]
- Reviewing for Funding Agencies:
 - Panelist for NSF Information and Intelligent Systems Division [2019]
 - Panelist for NSF Information and Intelligent Systems Division [2018]
 - Panelist for NSF Information and Intelligent Systems Division [2017]
 - Panelist for NSF Division of Industrial Innovation and Partnerships [2016]
 - Panelist for NSF Information and Intelligent Systems Division [2016]
 - Panelist for NSF Information and Intelligent Systems Division [2015]
 - External reviewer for NSF Information and Intelligent Systems Division [2015]
 - External reviewer for Fonds de recherche du Quebec [2014]
- Advisory Committee for:
 - 1st Workshop on Computer Vision for Earth Observation (CV4EO) Applications 2024 (Hosted as part of IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2024)

Memberships

- Senior Member: Institute of Electrical and Electronics Engineers
- Full Member: British Machine Vision Association and Society for Pattern Recognition
- Affiliate Member: International Association of Pattern Recognition

8 Teaching and Mentoring

Courses Taught

The following list summarizes the traditional, classroom courses I have taught:

- *Advances in Computer Vision*, CSE 659a, [F2024], Washington University in St. Louis
- *Computer Vision*, CSE 559a, [S2023, S2024, S2025], Washington University in St. Louis
- *Machine Learning*, CS 460g, [F2012, F2013, F2014, F2016, F2018, F2019], University of Kentucky
- *Computer Vision*, CS 636, [S2011, S2013, S2017], University of Kentucky
- *Learning-Based Methods for Computer Vision*, CS 585/685, [S2015], University of Kentucky
- *Advanced Topics in Computer Science: Machine Learning*, CS 685, [S2012], University of Kentucky
- *Intermediate Topics in Computer Science: Computational Photography*, CS 585, [F2010, F2011], University of Kentucky
- *Theory of Computation*, CECS 341, [F2002], University of Missouri

Mentoring

Postdoctoral Scholars

1. Adeel Ahmad (Ph.D. Geomatics, University of Punjab–Lahore) Dates: 2023–2024
Research Focus: Remote Sensing, Deep Learning, Land-Use Modeling
2. Benjamin Brodie (Ph.D. Mathematics, University of Kentucky) Dates: 2020–2022
Research Focus: Change Detection, Object Tracking, Re-Identification, Metric Learning
Employment: Research Scientist, Blue Halo

Ph.D. Students

1. [Paul Mihail](#) [*co-chair* with Judy Goldsmith] Degree: Ph.D., Computer Science
Title: Visualizing and Predicting the Effects of Rheumatoid Arthritis on Hands Date: May 2014
Employment: Professor, Computer Science, Valdosta State University
2. [Mohammad T. Islam](#) Degree: Ph.D., Computer Science
Title: Analyzing the Geo-Dependence of Human Face Appearance and Its Applications Date: Jul 2016
Employment: Associate Professor, Computer Science, Southern Connecticut State University
3. [Hamid Hamraz](#) Degree: Ph.D., Computer Science
Title: Computational Forest Modeling using Airborne Remote Sensing LiDAR Date: Apr 2018
Employment: Computational and Data Scientist, Microsoft
4. [Scott Workman](#) Degree: Ph.D., Computer Science
Title: Leveraging Overhead Imagery for Localization, Mapping, and Understanding Date: Apr 2018
Employment: Research Scientist, DZYNE Technologies
5. Menghua “Ted” Zhai Degree: Ph.D., Computer Science
Title: Deep Probabilistic Models for Camera Geo-Calibration Date: Dec 2018
Employment: Computer Vision Engineer, MatrixTime (startup)

6. **Zach Bessinger**
 Title: Modeling and Mapping Location-Dependent Human Appearance
 Employment: Senior Applied Scientist, Zillow
 Degree: Ph.D., Computer Science
 Date: Dec 2018
7. **Tawfiq Salem**
 Title: Learning to Map the Visual and Auditory World
 Employment: Visiting Assistant Professor, Computer and Information Technology, Purdue University
 Degree: Ph.D., Computer Science
 Date: Jul 2019
8. **Gongbo Liang**
 Title: Clinical-Inspired Multi-Modal Deep Learning Medical Imaging Analysis
 Employment: Assistant Professor, Computer Science, Eastern Kentucky University
 Degree: Ph.D., Computer Science
 Date: Oct 2020
9. **Usman Rafique** [*co-chair* with Samson Cheung]
 Title: Weakly Supervised Learning for Multi-Image Synthesis
 Employment: Research Scientist, Kitware Inc.
 Degree: Ph.D., Electrical Engineering
 Date: Jul 2021
10. **Hunter Blanton**
 Title: Revisiting Absolute Pose Regression
 Employment: Senior Computer Vision Engineer, Yembo (startup)
 Degree: Ph.D., Computer Science
 Date: Aug 2021
11. **Connor Greenwell**
 Title: Probabilistic Cross-Domain Representation Learning
 Employment: Senior R&D Engineer, Kitware Inc.
 Degree: Ph.D., Computer Science
 Date: Jun 2022
12. **Yu Zhang**
 Title: Multimodal Domain Generalization
 Employment: Assistant Professor, Computer Science, Boise State University
 Degree: Ph.D., Computer Science
 Date: Mar 2023
13. **Xin Xing** [*co-chair* with Ai-Ling Lin]
 Title: Structured Attention for Image Analysis
 Employment: Assistant Professor, University of Nebraska-Omaha
 Degree: Ph.D., Computer Science
 Date: Nov 2023
14. **Subash Khanal**
 Title: Multimodal Representation Learning for Geospatial Soundscape Mapping
 Degree: Ph.D., Computer Science
 Date: Jul 2025
15. Lydia Reader [*co-chair* with Ross Hammond]
 Title: Toward an Understanding of Heterogeneous Effects of Walkability on Children's Physical Activity
 Date: May 2026 (est)
 Degree: Ph.D., Computational & Data Sciences
16. Aayush Dhakal
 Title: TBD
 Degree: Ph.D., Computer Science
 Date: May 2026 (est)
17. Srikanth Sastry
 Title: TBD
 Degree: Ph.D., Imaging Science
 Date: May 2027 (est)
18. Michael Lanier [*co-chair* with Yevgeniy Vorobeychik]
 Title: TBD
 Degree: Ph.D., Computer Science
 Date: May 2027 (est)
19. Zhexiao Xiong
 Title: TBD
 Degree: Ph.D., Computer Science
 Date: May 2027 (est)
20. Alex Wollam
 Title: TBD
 Degree: Ph.D., Computer Science
 Date: TBD
21. Tong Li [*co-chair* with Joshua Oltmanns]
 Title: TBD
 Degree: Ph.D., Computational & Data Sciences
 Date: TBD

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| 22. Nia Hodges | Degree: Ph.D., Electrical and Systems Engineering |
| Title: TBD | Date: TBD |
| 23. Eric Xing | Degree: Ph.D., Computer Science |
| Title: TBD | Date: TBD |
| 24. Daniel Cher | Degree: Ph.D., Computational & Data Sciences |
| Title: TBD | Date: TBD |
| 25. Feng Qiao | Degree: Ph.D., Computer Science |
| Title: TBD | Date: TBD |

Visiting Ph.D. Students

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|---|------------------|
| 1. Patrick Tutzauer (University of Stuttgart) | Dates: Fall 2017 |
| Topic: Geospatial Trajectory Modeling | |
| 2. Raian Vargas Maretto (INPE, Brazil) | Dates: 2018–2019 |
| Topic: Deforestation Detection | |
| 3. Rafael Padilha (UNICAMP, Brazil) | Dates: 2019–2020 |
| Topic: Image Forensics | |
| 4. Alex Levering (Wageningen University) | Dates: 2022–2023 |
| Topic: Landscape Quality Assessment | |

Masters Students

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|---|------------------------------|
| 1. Feiyu Shi | Degree: MS, Computer Science |
| Title: Principal Component Analysis For Multi-size Images | Date: Dec 2013 |
| 2. Ryan Baltenberger | Degree: MS, Computer Science |
| Title: Estimating Transient Scene Attributes Using Deep Convolutional Neural Networks | Date: May 2016 |
| 3. William “Derek” Jones [<i>co-chair</i> w/ Sally Ellingson] | Degree: MS, Computer Science |
| Title: Scalable Feature Selection and Extraction with Applications in Kinase Polypharmacology | Date: May 2018 |
| 4. Weilian “William” Song | Degree: MS, Computer Science |
| Title: Image-Based Roadway Assessment using Convolutional Neural Networks | Date: May 2019 |
| 5. Armin Hadzic | Degree: MS, Computer Science |
| Title: Estimating Free-Flow Speed with LiDAR and Overhead Imagery | Date: May 2020 |
| 6. David Jones | Degree: MS, Computer Science |
| Title: Intensity Harmonization for Airborne LiDAR | Date: May 2021 |
| 7. Jacob Birge | Degree: MS, Computer Science |
| Title: A Cost-Sensitive Approach To Multimodal Fusion | Date: Dec 2021 |
| 8. Alex Greene | Degree: MS, Computer Science |
| Title: Using Aerial Imagery to Estimate Ground-level Object Distributions | Date: May 2023 |
| 9. Alex Wollam | Degree: MS, Computer Science |
| Title: Exploring Sequential Outdoor Panorama Synthesis with Diffusion Models | Date: Jul 2023 |

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| 10. Hongzhang Wang | Degree: MS, Computer Science Date: Dec 2023 |
| Title: Monocular Depth Estimation | |
| 11. Nia Hodges | Degree: MS, Engineering Data Analytics & Statistics Date: May 2024 |
| Title: Wide-Area Image Localization | |
| 12. Wanzhou Liu | Degree: MS, Computer Science Date: Fall 2024 |
| Title: High Efficiency Generalizable Driving World Model | |
| 13. Lunchi Guo | Degree: MS, Computer Engineering |
| Title: Deep Learning-Based Coordinate Prediction from Medical Fluoroscopic Images for Improved Radiation | |
| Date: Fall 2024 | |
| 14. Lunchi Guo | Degree: MS, Computer Engineering Date: Spring 2025 |
| Title: MedVid-Align: Intelligent Analysis of Medical Procedure Videos | |
| 15. Myan Sudharsanan | Degree: MS, Computer Engineering |
| Title: VisionLLMs in the Automotive Domain: Finegrained Details of Traffic Signs and Passenger Vehicles | |
| Date: Spring 2025 | |
| 16. Ethan Weilheimer | Degree: MS (thesis), Computer Science Date: Spring 2025 |
| Title: Partially Supervised Reinforcement Learning for GPS-Denied Navigation | |
| 17. Vinh Pham | Degree: MS, Engineering Data Analytics and Statistics Date: Spring 2025 |
| Title: Automated Satellite Imagery Analysis for Global Agricultural Field Boundary Detection | |
| 18. Shuhan (Steven) Zhang | Degree: MS, Computer Science Date: Spring 2025 |
| Title: Query-Specific Feature Transformation for Fine-Grained Image Retrieval | |
| 19. Jingyun Ma | Degree: MS, Computer Science Date: Spring 2025 |
| Title: Large Language Models for MCNP Input Generation | |
| 20. Jackson McCall | Degree: MS, Computer Science Date: Spring 2025 |
| Title: GeoSynth++: Large-Scale Satellite Image Synthesis | |
| 21. Haris Naveed | Degree: MS, Computer Science Date: Spring 2025 |
| Title: Deep Learning for Tree Canopy Height Estimation | |
| 22. Yitao Yu | Degree: MS, Computer Science Date: Fall 2025 |
| Title: Probabilistic Cross-Modal Embeddings | |
| 23. Mohammad Rouie Miab | Degree: MS, Computer Science Date: Spring 2026 |
| Title: Enhancing Semantic Precision in Text-to-Image Generation | |

Undergraduate Research Students

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|---|------------------|
| 1. Jim Knochelmann | Dates: 2011–2012 |
| Title: User-Tools for Aerial Image Registration | |
| 2. Kyle Kolpek | Dates: 2012 |
| Title: Aerial Image Registration | |
| 3. Noora Aljabi | Dates: 2013 |
| Title: Using Flickr to Map Phenological Trends | |

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| 4. J. David Smith | Dates: 2013–2015 |
| Title: User-in-the-loop Camera Calibration | |
| 5. Angelo Stekardis | Dates: 2014–2015 |
| Title: Understanding Facial Expressions | |
| 6. Ryan Baltenberger | Dates: 2012–2015 |
| Title: Understanding Outdoor Scene Appearance | |
| 7. Connor Greenwell | Dates: 2014–2016 |
| Title: Interactive Methods for Aerial Imagery Understanding | |
| 8. Sam Davidson | Dates: 2016–2017 |
| Title: Applications of Generative Adversarial Networks to Social Media Imagery | |
| 9. Aaron Mueller | Dates: 2018 |
| Title: Deep Learning for Educational Data | |
| 10. Weilian Song | Dates: 2016–2019 |
| Title: Applications of Deep Convolutional Neural Networks to Geometric Computer Vision | |
| 11. Yuhan Long | Dates: 2019 |
| Title: Deep Learning for Medical Imaging | |
| 12. Thomas Barber | Dates: 2019 |
| Title: Deep Learning for Remote Sensing | |
| 13. Sean Grate | Dates: 2019–2020 |
| Title: Deep Learning for Point Clouds | |
| 14. Shashank Bhatt | Dates: 2020–2022 |
| Title: Multi-Object Tracking | |
| 15. Evan Bolton | Dates: 2021 |
| Title: Generating Synthetic Training Data using a Game Engine | |
| 16. Julia Stekardis | Dates: 2021–2022 |
| Title: Large-Scale Image Geo-Localization | |
| 17. Gareth Walker | Dates: 2022 |
| Title: Remote Sensing for Social Good | |
| 18. Matthew Mitchell | Dates: 2022 |
| Title: Remote Sensing for Social Good | |
| 19. Cohen Archbold | Dates: 2020–2022 |
| Title: Automatic Real-Estate Price Estimation | |
| 20. Brian Wei | Dates: Fall 2025 |
| Title: Stereo Video Analysis | |
| 21. Dev Gupta | Dates: Fall 2025 |
| Title: Temporally-Consistent Stereo Video Generation | |
| 22. Ice Cui | Dates: Fall 2025 |
| Title: Leveraging Diffusion Transformers to Improve GeoSynth Scalability and Cross-Scale Consistency | |

High School Research Students

1. Ryan Baltenberger
Title: Gesture-Based User Interaction with the Microsoft Kinect
Dates: 2011–2012
2. Alex Lucas
Title: Evaluation of Automatic Face Detection Methods
Dates: 2014–2013
3. Andrew Tapia
Title: Estimating Surface Reflectivity
Dates: 2014–2015
4. Andrew Albrecht
Title: Mapping Social Media Imagery
Dates: 2016–2017
5. C. J. Labianca
Title: Evaluation of Optimization Algorithms for Deep Convolutional Neural Networks
Dates: 2016–2017
6. Ryan Landry
Title: RRADCL: Rapid Roadway Assessment with Deep Convolutional Learning
Dates: 2017–2018
7. Cohen Archbold
Title: Photo-Geolocation using Convolutional Neural Networks
Dates: 2017–2018
8. Nicole Wong
Title: Learning-Based View Synthesis
Dates: 2019–2020
9. Chris Wang
Title: Multimodal Medical Imaging for Alzheimer’s Disease Classification
Dates: 2019–2021
10. William Greenlee
Title: Deep Learning for Computer Vision
Dates: 2021–2022
11. Krishna Bhatraju
Title: Deep Motion Estimation
Dates: 2021–2022

Graduate Committees (as regular member or external examiner)

1. Edwin Prem Kumar Sathiyamoorthy
Role: member
Title: Global Change Reactive Background Subtraction
Degree: M.S., Electrical Engineering
Date: Spring 2011
2. Ju Shen
Role: member
Title: Computational Multimedia for Video Self Modeling
Degree: Ph.D., Electrical Engineering
Date: Spring 2014
3. Hasan Sajid
Role: member
Title: A Universal Background Subtraction System
Degree: M.S., Electrical Engineering
Date: Summer 2014
4. Chenxi Zhang
Role: member
Title: Depth-assisted Image Segmentation, Enhancement and Visualization
Degree: Ph.D., Computer Science
Date: Fall 2014
5. Mao Ye
Role: member
Title: 3D Reconstruction and Motion Analysis of Deformable Objects with Consumer Depth Cameras
Degree: Ph.D., Computer Science
Date: Fall 2014

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| 6. | Yan Huang | Degree: Ph.D., Computer Science |
| | Role: member | Date: Fall 2014 |
| | Title: Novel Computational Methods for Transcript Reconstruction and Quantification using RNA-SEQ Data | |
| 7. | Shaoceng Wei | Degree: Ph.D., Statistics |
| | Role: outside examiner | Date: Spring 2015 |
| | Title: Multi-state Models for Interval Censored Data with Competing Risk | |
| 8. | Bo Fu | Degree: Ph.D., Computer Science |
| | Role: member | Date: Spring 2015 |
| | Title: Towards Intelligent Telerobotics: Visualization and Control of Remote Robot | |
| 9. | Harikrishnan Unnikrishnan | Degree: Ph.D., Electrical Engineering |
| | Role: member | Date: Fall 2015 |
| | Title: Analysis of Vocal Fold Kinematics using High Speed Video | |
| 10. | Sean Karlage | Degree: M.S., Computer Science |
| | Role: member | Date: Spring 2016 |
| | Title: Diachronic Volume Registration for Analysis of Antiquities | |
| 11. | Hasan Sajid | Degree: Ph.D., Electrical Engineering |
| | Role: member | Date: Summer 2016 |
| | Title: Robust Background Subtraction for Moving Cameras and their Applications in Ego-vision Systems | |
| 12. | Stanley Rosenbaum | Degree: M.S., Computer Science |
| | Role: member | Date: Fall 2016 |
| | Title: A method for presenting volume and color of 3D objects via audio for the visually impaired | |
| 13. | DhiShankar Bhattacharya | Degree: M.S., Computer Science |
| | Role: member | Date: Spring 2017 |
| | Title: Analyzing Sybil Attacks and Similar Phenomena in Twitter Data | |
| 14. | Wesley Hough | Degree: Ph.D., Computer Science |
| | Role: outside examiner | Date: Spring 2017 |
| | Title: On Independence, Matching, and Homomorphism Complexes | |
| 15. | Qingguo Xu | Degree: M.S., Computer Science |
| | Role: member | Date: Spring 2017 |
| | Title: 3D Body Tracking using Deep Learning | |
| 16. | Xiaofei Zhang | Degree: M.S., Computer Science |
| | Role: member | Date: Summer 2017 |
| | Title: Mammogram and Tomosynthesis Classification Using Convolutional Neural Networks | |
| 17. | Yajie Zhao | Degree: Ph.D., Computer Science |
| | Role: member | Date: Fall 2017 |
| | Title: 3D Human Face Reconstruction and 2D Appearance Synthesis | |
| 18. | Po-Chang Su | Degree: Ph.D., Electrical Engineering |
| | Role: member | Date: Fall 2017 |
| | Title: Real-time Capture and Rendering of Physical Scene with an Efficiently Calibrated RGB-D Camera Network | |
| 19. | Anthony Rios | Degree: Ph.D., Computer Science |
| | Role: member | Date: Summer 2018 |
| | Title: Deep Neural Networks for Multi-Label Text Classification: Application to Coding Electronic Medical Records | |

20. Ethan Welty (University of Colorado–Boulder)
 Role: member
 Title: High-Precision Photogrammetry for Glaciology
- Degree: Ph.D., Environmental Studies
 Date: Summer 2018
21. Yannick Hold-Geoffroy (Laval University, Quebec, CA)
 Role: member
 Title: Learning Geometric and Lighting priors from Natural Images
- Degree: Ph.D., Computer Science
 Date: Summer 2018
22. Nkiruka Uzuegbunam
 Role: member
 Title: Self-Image Multimedia Technologies for Feedforward Observational Learning
- Degree: Ph.D., Electrical Engineering
 Date: Oct 2018
23. Nam Vo (Georgia Institute of Technology)
 Role: member
 Title: Image Geolocalization with Deep Learning
- Degree: Ph.D., Computer Science
 Date: Spring 2019
24. Jinping Zhuge
 Role: outside examiner
 Title: Boundary layers in periodic homogenization
- Degree: Ph.D., Math
 Date: Spring 2019
25. Ryan Zembrodт
 Role: member
 Title: Open-World Story Generation with Sequence-to-Sequence and Hierarchical Recurrent Encoder-Decoder Models
- Degree: M.S., Computer Science
 Date: Spring 2019
26. Jonathan Dingess
 Role: member
 Title: Epsilon-Superposition and Truncation Dimension in Average and Probabilistic Settings for Infinite-Variate Linear Problems
- Degree: M.S., Computer Science
 Date: Spring 2019
27. Genghis Goodman
 Role: member
 Title: A Machine Learning Approach to Artificial Floorplan Generation
- Degree: M.S., Computer Science
 Date: Summer 2019
28. Xinxin Zuo
 Role: member
 Title: Depth Enhancement and Surface Reconstruction with RGB-D sequence
- Degree: Ph.D., Computer Science
 Date: Oct 2019
29. Sifei Han
 Role: member
 Title: Text Mining Methods for Analyzing Online Health Information and Communication
- Degree: Ph.D., Computer Science
 Date: Fall 2019
30. Shivangi Srivastava (Wageningen University, Netherlands)
 Role: member
 Title: Mapping of urban landuse and landcover with multiple sensors: joining close and remote sensing with deep learning
- Degree: Ph.D., Computer Science
 Date: Feb 2020
31. Raian Maretto (National Institute for Space Research)
 Role: member
 Title: Deep Learning techniques applied to classification of Remote Sensing Images
- Degree: Ph.D., Geoinformation Science
 Date: Feb 2020
32. Kyle Helfrich
 Role: member
 Title: Orthogonal Recurrent Neural Networks and Batch Normalization in Deep Neural Networks
- Degree: Ph.D., Math
 Date: Spring 2020

33. Subash Khanal
Role: member
Title: Mispronunciation Detection and Diagnosis in Mandarin Accented English Speech

34. Narjes Bozorg
Role: member
Title: Articulatory-Wavenet: Deep Autoregressive Model for Acoustic-to-Articulatory Inversion

35. Céline Portenier (University of Bern)
Role: external referee
Title: High-resolution snow cover retrieval using public webcams

36. Ahmed Nassar (IRISA, Université Bretagne Sud, Vannes)
Role: external referee
Title: Learning to map street-side objects using multiple views

37. Alireza Shirvani
Role: member
Title: Personality and Emotion for Virtual Characters in Strong-story Narrative Planning

38. Sajad Javadinasab Hormozabad
Role: member
Title: Artificial Intelligence and Soft Computing in Smart Structural Systems

39. Chengxi Li
Role: member
Title: Supporting Stylized Language Models using Multi-Modality Features

40. Tarannum Shaila Zaman
Role: member
Title: An Automated Framework to Debug System-Level Concurrency Failures

41. David Adeniji
Role: member
Title: Establishing a Digital Process Twin for Aerospace Alloy Machining using In-situ Process Characterization and Physics Embedded Machine Learning Models

42. Eike Jens Hoffmann (Technical University of Munich)
Role: reviewer
Title: Predicting Building Functions on Large Scale by Fusing Social Media and Remote Sensing Data

43. Arnab Sarkar
Role: member
Title: Understanding the Physics of Galaxy Clusters Out to their Virial Radii and Beyond

44. Yuan Liu
Role: member
Title: Skeleton-Based Analysis of Melt Networks

45. Aiden McIlraith
Role: member
Title: Spatial Transcriptome Visualizer

46. Zhou Chu
Role: member
Title: Adapting at time series machine learning models to a real informatics pipe

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| 47. Zihao Zou | Degree: M.S., Computer Science Date: Fall 2022 |
| Role: member | |
| Title: Deep Model-Based Architectures using Explicit Regularizers for Computational Imaging | |
| 48. Ashutosh Timilsina | Degree: Ph.D., Computer Science Date: Spring 2023 |
| Role: member | |
| Title: Peer-to-peer Energy Trading in Smart Residential Environment with User Behavioral Modeling | |
| 49. Nan Huang | Degree: M.S., Computer Science Date: Spring 2023 |
| Role: member | |
| Title: Toward Continuous Regularizer for Imaging Inverse Problems | |
| 50. Md Selim | Degree: Ph.D., Computer Science Date: Spring 2023 |
| Role: member | |
| Title: Deep Learning Models for CT Image Standardization | |
| 51. Di Huang | Degree: M.S., Computer Science Date: Spring 2023 |
| Role: member | |
| Title: Deep Neural Networks for Infant Pose Estimation | |
| 52. Peizhen Tong | Degree: M.S., Computer Science Date: Spring 2023 |
| Role: member | |
| Title: Adversarial Patch Attacks on Deep Reinforcement Learning | |
| 53. David Sarpong | Degree: M.S., Computer Science Date: Spring 2023 |
| Role: member | |
| Title: Adversarial Defenses against Interpolation Attacks on Semi-Supervised Learning Systems | |
| 54. Yihang Xu | Degree: M.S., Computer Science Date: Spring 2023 |
| Role: member | |
| Title: Real-Time Action Segmentation in a Smart Kitchen System | |
| 55. Stephen Parsons | Degree: Ph.D., Computer Science Date: Summer 2023 |
| Role: member | |
| Title: Hard-Hearted Scrolls: A Noninvasive Method for Reading the Herculaneum Papyri | |
| 56. Brian Chao | Degree: M.S., Computer Science Date: Summer 2023 |
| Role: member | |
| Title: Adversarial Attacks on AI Systems in Medical Applications | |
| 57. Chang Ti | Degree: M.S., Computer Science Date: Fall 2023 |
| Role: member | |
| Title: Handwritten Digit Recognition Web Plugin | |
| 58. Emma McMillian | Degree: M.S., Computer Science Date: Fall 2023 |
| Role: member | |
| Title: Convolutional Neural Networks for Hyperspectral Image-to-Image Microscopy Translation | |
| 59. Fiona Xu | Degree: M.S., Computer Science Date: Fall 2023 |
| Role: member | |
| Title: Adversarial Attack on Graph Embeddings from Text Dataset | |
| 60. Kyle Montgomery | Degree: M.S., Computer Science Date: Spring 2024 |
| Role: member | |
| Title: Exploring the Reasoning Abilities of Large Language Models | |

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| 61. | Joshua Tang Role: member Title: Autonomous Vehicle Object Classification with Uncertainty | Degree: M.S., Computer Science Date: Spring 2024 |
| 62. | Patrick Lynch Role: member Title: An Automated System for Detecting Errors in Oatmeal-Making Research Task | Degree: M.S., Computer Science Date: Spring 2024 |
| 63. | Owen Ma Role: member Title: Towards Verified Vision-Based Neural Network Controllers for Autonomous Lane-Following | Degree: M.S., Computer Science Date: Fall 2024 |
| 64. | Minoo Hosseinzadeh Role: member Title: Smart QoS-Aware Resource Management For Edge Intelligence Systems | Degree: Ph.D., Computer Science Date: Fall 2024 |
| 65. | Junlin Wu Role: member Title: Trustworthy Autonomy Through Robust Control and Alignment | Degree: Ph.D., Computer Science Date: Spring 2025 |
| 66. | Evin Jaff Role: member Title: SwiftFake: Real-Time Defense Against Deepfake Calls | Degree: M.S., Computer Science Date: Fall 2024 |
| 67. | Yin Li Role: member Title: 3D Analysis of Spatial Transcriptome | Degree: M.S., Computer Science Date: Fall 2024 |
| 68. | Sizhe Zhang Role: member Title: ProofTutor: LLM-based formal math proving model | Degree: A.M., Statistics Date: Fall 2024 |
| 69. | Ye Htet Role: member Title: System Design and Task Scheduling for Real-Time Scientific Sensing Applications in Space | Degree: Ph.D., Computer Science Date: Fall 2024 |
| 70. | Zifan Wang Role: member Title: GCHP Workload Balancing | Degree: M.S., Computer Science Date: Spring 2025 |
| 71. | Yuxuan Yang Role: member Title: Training Safety Filters for Safe Control with Partial Observed and Un-labeled Data | Degree: M.S., Computer Science Date: Spring 2025 |
| 72. | Haris Naveed Role: chair Title: Deep Leraning for Tree Canopy Height Estimation | Degree: M.S., Computer Science Date: Spring 2025 |
| 73. | Sheng-Chieh Lin (University of Kentucky) Role: member Title: Machine Learning for Mapping and Understanding Galaxy Clusters | Degree: Ph.D., Physics Date: Spring 2025 |
| 74. | Hao Liu Role: member Title: Toward Graph Foundation Models: Few-shot and Zero-shot Learning on Graphs | Degree: Ph.D., Computer Science Date: Spring 2025 |

75. Weining Wang
Role: member
Title: Corrupted MRI Brain Image Restoration with Neural Networks
Degree: M.S., CSE
Date: Spring 2026
76. Sidrah Liaqat (University of Kentucky)
Role: member
Title: Model-based Deep Learning Techniques for Detecting Behaviors Related to Autism Spectrum Disorder from Video
Degree: Ph.D., Electrical Engineering
Date: TBD
77. Gustavo Gratacós
Role: member
Title: TBD
Degree: Ph.D., Computer Science
Date: TBD
78. Pan Xiao
Role: member
Title: Text and Image Representation Learning for Radiology Image Analysis
Degree: Ph.D., Imaging Science
Date: TBD
79. Nischal Khanal
Role: member
Title: Cortical Motor Programs as Biomarkers for Functional Impairment and Recovery After Stroke
Degree: Ph.D., Imaging Science
Date: TBD
80. Christoph Gerhardt (Technische Universität Ilmenau)
Role: member
Title: Outdoor Appearance Transfer
Degree: Ph.D., Computer Science
Date: TBD
81. Weijie Gan
Role: member
Title: Deep Learning-based Computational Imaging
Degree: Ph.D., Computer Science
Date: TBD
82. Anindya Sarkar
Role: member
Title: TBD
Degree: Ph.D., Computer Science
Date: TBD
83. Rachel Badzioch (Notre Dame University)
Role: member
Title: Detecting Visual Features in Permafrost
Degree: Ph.D., Biological Sciences
Date: TBD
84. Yiwen Ju
Role: member
Title: Implicit Surface Reconstruction
Degree: Ph.D., Computer Science
Date: TBD
85. Ruiqi Wang
Role: member
Title: Real-time and Embedded Systems and Efficient Human Activity Recognition
Degree: Ph.D., Computer Science
Date: TBD
86. Kyle Wolford
Role: member
Title: Enhancing Plug-and-Play Image Registration via Diffusion
Degree: M.S., Computer Science
Date: Spring 2025
87. Je-Hoon Michael Oh
Role: member
Title: TBD
Degree: Ph.D., Computational Systems Biology
Date: TBD
88. Morris Alper (Tel Aviv University)
Role: member
Title: TBD
Degree: Ph.D., Computer Science
Date: TBD

89. Tri Pham Degree: Ph.D., Computer Science
Role: member Date: TBD
Title: Adaptive Historical Context: Granular Activity Tracking for Interruption Recovery in Software Development

90. Yu Yan Degree: Ph.D., EECE
Role: member Date: TBD
Title: Improvement and Analysis of Ambient Nitrogen Dioxide Estimation with Machine Learning, Satellite Remote Sensing, and Chemical Transport

91. Evelyn Yang Degree: Ph.D., CSE
Role: member Date: TBD
Title: TBD

92. Aadarsha Gopala Reddy Degree: M.S., CSE
Role: member Date: TBD
Title: TBD

Oral Qualifying Exam Committees

| Student | Date | Advisor |
|-----------------|-------------|--------------------|
| Junlin Wu | Fall 2022 | Eugene Vorobeychik |
| Ye Htet | Spring 2023 | Jeremy Buhler |
| Han Liu | Spring 2023 | Ning Zhang |
| Yiwen Ju | Spring 2023 | Tao Ju |
| Jiarui Feng | Summer 2023 | Yixin Chen |
| Lydia Reader | Spring 2023 | Ross Hammond |
| Tri Pham | Fall 2023 | Caitlin Kelleher |
| Jingxuan Zhu | Summer 2024 | |
| Aaron Adkins | Summer 2024 | Chou Zhou |
| Ben Warner | Spring 2025 | Chenyang Lu |
| Chengsong Huang | Spring 2025 | Jixin Huang |
| Peter Rong | Spring 2025 | Tao Ju |