

# Nathan Jacobs

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## Areas of Expertise

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

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## 1 Education

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

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

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

## Prior

<b>Professor (with Tenure)</b>	Dept. of Computer Science, University of Kentucky <i>Lexington, KY</i>
2021–2022	
<b>Director of Graduate Studies (Data Science)</b>	Dept. of Computer Science, University of Kentucky <i>Lexington, KY</i>
2020–2022	
<b>Member</b>	Institute for Biomedical Informatics, University of Kentucky <i>Lexington, KY</i>
2017–2022	
<b>Associate Professor (with Tenure)</b>	Dept. of Computer Science, University of Kentucky <i>Lexington, KY</i>
2016–2021	
<b>Co-Department Chair (interim)</b>	Dept. of Computer Science, University of Kentucky <i>Lexington, KY</i>
2019–2020	
<b>Affiliated Faculty</b>	Center for Visualization and Virtual Environments, University of Kentucky <i>Lexington, KY</i>
2010–2019	
<b>Visiting Research Scientist (sabbatical)</b>	Orbital Insight, Inc. <i>Mountain View, CA</i>
2017–2018	
<b>Assistant Professor</b>	Dept. of Computer Science, University of Kentucky <i>Lexington, KY</i>
2010–2016	
<b>Computer Vision Research Intern</b>	ObjectVideo, Inc. <i>Reston, VA</i>
2008	
<b>Graduate Research Assistant</b>	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. Khanal, S. Sastry, A. Dhakal, A. Ahmad, and N. Jacobs, *Sat2Sound: A unified framework for zero-shot soundscape mapping*, May 2025. arXiv: [2505.13777 \[cs.CV\]](https://arxiv.org/abs/2505.13777).
- [2] Z. Xiong, W. Xiong, J. Shi, H. Zhang, Y. Song, and N. Jacobs, *GroundingBooth: Grounding text-to-image customization*, Sep. 2024. arXiv: [2409.08520 \[cs.CV\]](https://arxiv.org/abs/2409.08520).

### Refereed Conference Papers

- [1] F. Qiao, Z. Xiong, X. Zhu, Y. Ma, Q. He, and N. Jacobs, “MCPDepth: omnidirectional depth estimation via stereo matching from multi-cylindrical panoramas,” in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, vol. 2408.01653, Mar. 2026. arXiv: [2408.01653 \[cs.CV\]](https://arxiv.org/abs/2408.01653).
- [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.
- [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 \[cs.CV\]](https://arxiv.org/abs/2505.21647).
- [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 \[cs.CV\]](https://arxiv.org/abs/2503.12720).
- [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](https://arxiv.org/abs/2505.20764) [cs.CV].
- [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](https://arxiv.org/abs/2409.16252) [cs.CV].
- [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](https://arxiv.org/abs/2412.17854) [cs.LG].
- [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](https://arxiv.org/abs/2411.00683) [cs.CV].
- [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](https://arxiv.org/abs/2402.09290) [cs.LG].
- [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](https://arxiv.org/abs/2406.01917) [cs.CV].
- [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](https://arxiv.org/abs/2408.07050) [cs.CV].
- [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](https://arxiv.org/abs/2310.02903) [cs.LG].
- [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).
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- [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. Bopaiah, 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).
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- [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).
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- [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).
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- [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).
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- [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).
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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.
- [5] M. Mohr, M. Roby, I. Bosloper, H. Kerner, N. Jacobs, and C. Robinson, “Fields of The World and fiboa: Towards interoperable worldwide agricultural field boundaries through standardization and machine-learning,” in *Living Planet Symposium (LPS)*, Jun. 2025.
- [6] A. Ahmad, A. Dhakal, S. Sastry, S. Khanal, E. Xing, and N. Jacobs, “Improved canopy vertical structural diversity mapping across varied topographies using deep learning techniques,” in *American Geophysical Union (AGU) Fall Meeting Abstracts*, Dec. 2024.
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- [11] A. Dhakal, S. Khanal, S. Sastry, A. Ahmad, and N. Jacobs, “GeoBind: Binding text, image, and audio through satellite images,” in *IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, (oral), Jul. 2024. arXiv: [2404.11720](https://arxiv.org/abs/2404.11720).
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- [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.
- [39] W. Song, T. Salem, N. Jacobs, and M. Johnson, “Detecting the presence of bird vocalizations in audio segments using a convolutional neural network architecture,” in *International Symposium on Acoustic Communication by Animals*, 2017.
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## Technical Reports

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## Datasets

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- [2] M. T. Islam, C. Greenwell, and N. Jacobs, *GeoFaces: A large database of geolocated face patches*, <http://mvrl.github.io/GeoFaces>.
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- [4] P. Mihail, S. Workman, Z. Bessinger, and N. Jacobs, *SkyFinder: A large dataset of webcam images annotated with sky regions*, <https://mvrl.github.io/SkyFinder>.
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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>.
- [8] S. Workman and N. Jacobs, *Cross-View ScenicOrNot (CVSoN)*, <https://mvrl.github.io/CVSoN>.
- [9] S. Workman and N. Jacobs, *Crossview USA (CVUSA): A large dataset containing millions of pairs of ground-level and aerial/satellite images from across the United States*. <https://mvrl.github.io/CVUSA>.
- [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

- [1] N. Jacobs and S. Workman, *Network architecture for generating a labeled overhead image*, US Patent App. 16/045,606, Jan. 2020.
- [2] J. A. G. Whitney, J. T. Fessler, Z. C. N. Kratzer, N. B. Jacobs, A. M. Whitney, et al., *Method and system for estimating error in predicted distance using RSSI signature*, Jan. 2016.

## 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: <b>Nathan Jacobs</b>
Sponsor: Google	Date: Aug 2018
Amount/Value: \$5,000	
2. <i>NVIDIA Titan X GPU</i>	PI: <b>Nathan Jacobs</b>
Sponsor: NVIDIA	Date: Oct 2016
Amount/Value: \$778	
3. <i>AWS Research Education Grant</i>	PI: <b>Nathan Jacobs</b>
Sponsor: Amazon	Date: Jul 2015
Amount/Value: \$5,000	
4. <i>NVIDIA Tesla K40 GPU</i>	PI: <b>Nathan Jacobs</b>
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](#) Degree: Ph.D., Computer Science  
Title: Modeling and Mapping Location-Dependent Human Appearance Date: Dec 2018  
Employment: Senior Applied Scientist, Zillow
7. [Tawfiq Salem](#) Degree: Ph.D., Computer Science  
Title: Learning to Map the Visual and Auditory World Date: Jul 2019  
Employment: Visiting Assistant Professor, Computer and Information Technology, Purdue University
8. [Gongbo Liang](#) Degree: Ph.D., Computer Science  
Title: Clinical-Inspired Multi-Modal Deep Learning Medical Imaging Analysis Date: Oct 2020  
Employment: Assistant Professor, Computer Science, Eastern Kentucky University
9. [Usman Rafique](#) [*co-chair* with Samson Cheung] Degree: Ph.D., Electrical Engineering  
Title: Weakly Supervised Learning for Multi-Image Synthesis Date: Jul 2021  
Employment: Research Scientist, Kitware Inc.
10. [Hunter Blanton](#) Degree: Ph.D., Computer Science  
Title: Revisiting Absolute Pose Regression Date: Aug 2021  
Employment: Senior Computer Vision Engineer, Yembo (startup)

11. Connor Greenwell	Degree: Ph.D., Computer Science Date: Jun 2022
Title: Probabilistic Cross-Domain Representation Learning Employment: Senior R&D Engineer, Kitware Inc.	
12. Yu Zhang	Degree: Ph.D., Computer Science Date: Mar 2023
Title: Multimodal Domain Generalization Employment: Assistant Professor, Computer Science, Boise State University	
13. Xin Xing [co-chair with Ai-Ling Lin]	Degree: Ph.D., Computer Science Date: Nov 2023
Title: Structured Attention for Image Analysis Employment: Assistant Professor, University of Nebraska-Omaha	
14. Subash Khanal	Degree: Ph.D., Computer Science Date: Jul 2025
Title: Multimodal Representation Learning for Geospatial Soundscape Mapping	
15. Lydia Reader [co-chair with Ross Hammond]	Degree: Ph.D., Computational & Data Sciences Date: May 2026 (est)
Title: Toward an Understanding of Heterogeneous Effects of Walkability on Children's Physical Activity	
16. Aayush Dhakal	Degree: Ph.D., Computer Science Date: May 2026 (est)
Title: TBD	
17. Srikumar Sastry	Degree: Ph.D., Imaging Science Date: May 2027 (est)
Title: TBD	
18. Michael Lanier [co-chair with Yevgeniy Vorobeychik]	Degree: Ph.D., Computer Science Date: May 2027 (est)
Title: TBD	
19. Zhexiao Xiong	Degree: Ph.D., Computer Science Date: May 2027 (est)
Title: TBD	
20. Alex Wollam	Degree: Ph.D., Computer Science Date: TBD
Title: TBD	
21. Tong Li [co-chair with Joshua Oltmanns]	Degree: Ph.D., Computational & Data Sciences Date: TBD
Title: TBD	
22. Nia Hodges	Degree: Ph.D., Electrical and Systems Engineering Date: TBD
Title: TBD	
23. Eric Xing	Degree: Ph.D., Computer Science Date: TBD
Title: TBD	
24. Daniel Cher	Degree: Ph.D., Computational & Data Sciences Date: TBD
Title: TBD	
25. Feng Qiao	Degree: Ph.D., Computer Science Date: TBD
Title: TBD	

## Visiting Ph.D. Students

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|--|------------------|
| 1. Patrick Tutzauer (University of Stuttgart)<br>Topic: Geospatial Trajectory Modeling | Dates: Fall 2017 |
| 2. Raian Vargas Maretto (INPE, Brazil)<br>Topic: Deforestation Detection               | Dates: 2018–2019 |

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

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 [*co-chair* 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
10. Hongzhang Wang Degree: MS, Computer Science  
 Title: Monocular Depth Estimation Date: Dec 2023
11. Nia Hodges Degree: MS, Engineering Data Analytics & Statistics  
 Title: Wide-Area Image Localization Date: May 2024
12. Wanzhou Liu Degree: MS, Computer Science  
 Title: High Efficiency Generalizable Driving World Model Date: Fall 2024
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  
 Title: MedVid-Align: Intelligent Analysis of Medical Procedure Videos Date: Spring 2025
15. Myan Sudharsanan Degree: MS, Computer Engineering  
 Title: VisionLLMs in the Automotive Domain: Finegrained Details of Traffic Signs and Passenger Vehicles Date: Spring 2025

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| 16. Ethan Weilheimer   | Degree: MS (thesis), Computer Science                 |
| Title: Partially Supervised Reinforcement Learning for GPS-Denied Navigation                 | Date: Spring 2025                                     |
| 17. Vinh Pham  | Degree: MS, Engineering Data Analytics and Statistics |
| Title: Automated Satellite Imagery Analysis for Global Agricultural Field Boundary Detection | Date: Spring 2025                                     |
| 18. Shuhan (Steven) Zhang  | Degree: MS, Computer Science                          |
| Title: Query-Specific Feature Transformation for Fine-Grained Image Retrieval                | Date: Spring 2025                                     |
| 19. Jingyun Ma   | Degree: MS, Computer Science                          |
| Title: Large Language Models for MCNP Input Generation                                       | Date: Spring 2025                                     |
| 20. Jackson McCall   | Degree: MS, Computer Science                          |
| Title: GeoSynth++: Large-Scale Satellite Image Synthesis                                     | Date: Spring 2025                                     |
| 21. Haris Naveed   | Degree: MS, Computer Science                          |
| Title: Deep Learning for Tree Canopy Height Estimation                                       | Date: Spring 2025                                     |
| 22. Yitao Yu   | Degree: MS, Computer Science                          |
| Title: Probabilistic Cross-Modal Embeddings  | Date: Fall 2025                                       |
| 23. Mohammad Rouie Miab  | Degree: MS, Computer Science                          |
| Title: Enhancing Semantic Precision in Text-to-Image Generation                              | Date: Spring 2026                                     |

## **Undergraduate Research Students**

- |  |                  |
|--|------------------|
| 1. Jim Knochelmann<br>Title: User-Tools for Aerial Image Registration                                      | Dates: 2011–2012 |
| 2. Kyle Kolpek<br>Title: Aerial Image Registration   | Dates: 2012      |
| 3. Noora Aljabi<br>Title: Using Flickr to Map Phenological Trends  | Dates: 2013      |
| 4. J. David Smith<br>Title: User-in-the-loop Camera Calibration  | Dates: 2013–2015 |
| 5. Angelo Stekardis<br>Title: Understanding Facial Expressions   | Dates: 2014–2015 |
| 6. Ryan Baltenberger<br>Title: Understanding Outdoor Scene Appearance                                      | Dates: 2012–2015 |
| 7. Connor Greenwell<br>Title: Interactive Methods for Aerial Imagery Understanding                         | Dates: 2014–2016 |
| 8. Sam Davidson<br>Title: Applications of Generative Adversarial Networks to Social Media Imagery          | Dates: 2016–2017 |
| 9. Aaron Mueller<br>Title: Deep Learning for Educational Data  | Dates: 2018      |
| 10. Weilian Song<br>Title: Applications of Deep Convolutional Neural Networks to Geometric Computer Vision | Dates: 2016–2019 |

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	Dates: 2011–2012
Title: Gesture-Based User Interaction with the Microsoft Kinect	
2. Alex Lucas	Dates: 2014–2013
Title: Evaluation of Automatic Face Detection Methods	
3. Andrew Tapia	Dates: 2014–2015
Title: Estimating Surface Reflectivity	
4. Andrew Albrecht	Dates: 2016–2017
Title: Mapping Social Media Imagery	
5. C. J. Labianca	Dates: 2016–2017
Title: Evaluation of Optimization Algorithms for Deep Convolutional Neural Networks	
6. Ryan Landry	Dates: 2017–2018
Title: RRADCL: Rapid Roadway Assessment with Deep Convolutional Learning	
7. Cohen Archbold	Dates: 2017–2018
Title: Photo-Geolocation using Convolutional Neural Networks	

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|---|------------------|
| 8. Nicole Wong<br>Title: Learning-Based View Synthesis                                    | Dates: 2019–2020 |
| 9. Chris Wang<br>Title: Multimodal Medical Imaging for Alzheimer's Disease Classification | Dates: 2019–2021 |
| 10. William Greenlee<br>Title: Deep Learning for Computer Vision                          | Dates: 2021–2022 |
| 11. Krishna Bhatraju<br>Title: Deep Motion Estimation                                     | Dates: 2021–2022 |

## **Graduate Committees (as regular member or external examiner)**

- |  |   |
|--|---|
| 1. Edwin Prem Kumar Sathiyamoorthy<br>Role: member<br>Title: Global Change Reactive Background Subtraction                             | Degree: M.S., Electrical Engineering<br>Date: Mar 2011  |
| 2. Ju Shen<br>Role: member<br>Title: Computational Multimedia for Video Self Modeling  | Degree: Ph.D., Electrical Engineering<br>Date: May 2014 |
| 3. Hasan Sajid<br>Role: member<br>Title: A Universal Background Subtraction System   | Degree: M.S., Electrical Engineering<br>Date: Jul 2014  |
| 4. Chenxi Zhang<br>Role: member<br>Title: Depth-assisted Image Segmentation, Enhancement and Visualization                             | Degree: Ph.D., Computer Science<br>Date: Dec 2014       |
| 5. Mao Ye<br>Role: member<br>Title: 3D Reconstruction and Motion Analysis of Deformable Objects with Consumer Depth Cameras            | Degree: Ph.D., Computer Science<br>Date: Dec 2014       |
| 6. Yan Huang<br>Role: member<br>Title: Novel Computational Methods for Transcript Reconstruction and Quantification using RNA-SEQ Data | Degree: Ph.D., Computer Science<br>Date: Dec 2014       |
| 7. Shaoceng Wei<br>Role: outside examiner<br>Title: Multi-state Models for Interval Censored Data with Competing Risk                  | Degree: Ph.D., Statistics<br>Date: May 2015             |
| 8. Bo Fu<br>Role: member<br>Title: Towards Intelligent Telerobotics: Visualization and Control of Remote Robot                         | Degree: Ph.D., Computer Science<br>Date: May 2015       |
| 9. Harikrishnan Unnikrishnan<br>Role: member<br>Title: Analysis of Vocal Fold Kinematics using High Speed Video                        | Degree: Ph.D., Electrical Engineering<br>Date: Dec 2015 |
| 10. Sean Karlage<br>Role: member<br>Title: Diachronic Volume Registration for Analysis of Antiquities                                  | Degree: M.S., Computer Science<br>Date: May 2016        |

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|-----|---|---|
| 11. | Hasan Sajid<br>Role: member<br>Title: Robust Background Subtraction for Moving Cameras and their Applications in Ego-vision Systems               | Degree: Ph.D., Electrical Engineering<br>Date: Jul 2016 |
| 12. | Stanley Rosenbaum<br>Role: member<br>Title: A method for presenting volume and color of 3D objects via audio for the visually impaired            | Degree: M.S., Computer Science<br>Date: Dec 2016        |
| 13. | DhiShankar Bhattacharya<br>Role: member<br>Title: Analyzing Sybil Attacks and Similar Phenomena in Twitter Data                                   | Degree: M.S., Computer Science<br>Date: Apr 2017        |
| 14. | Wesley Hough<br>Role: outside examiner<br>Title: On Independence, Matching, and Homomorphism Complexes  | Degree: Ph.D., Computer Science<br>Date: May 2017       |
| 15. | Qingguo Xu<br>Role: member<br>Title: 3D Body Tracking using Deep Learning   | Degree: M.S., Computer Science<br>Date: May 2017        |
| 16. | Xiaofei Zhang<br>Role: member<br>Title: Mammogram and Tomosynthesis Classification Using Convolutional Neural Networks                            | Degree: M.S., Computer Science<br>Date: Jul 2017        |
| 17. | Yajie Zhao<br>Role: member<br>Title: 3D Human Face Reconstruction and 2D Appearance Synthesis   | Degree: Ph.D., Computer Science<br>Date: Dec 2017       |
| 18. | Po-Chang Su<br>Role: member<br>Title: Real-time Capture and Rendering of Physical Scene with an Efficiently Calibrated RGB-D Camera Network       | Degree: Ph.D., Electrical Engineering<br>Date: Dec 2017 |
| 19. | Anthony Rios<br>Role: member<br>Title: Deep Neural Networks for Multi-Label Text Classification: Application to Coding Electronic Medical Records | Degree: Ph.D., Computer Science<br>Date: Jun 2018       |
| 20. | Ethan Welty (University of Colorado–Boulder)<br>Role: member<br>Title: High-Precision Photogrammetry for Glaciology                               | Degree: Ph.D., Environmental Studies<br>Date: Jul 2018  |
| 21. | Yannick Hold-Geoffroy (Laval University, Quebec, CA)<br>Role: member<br>Title: Learning Geometric and Lighting priors from Natural Images         | Degree: Ph.D., Computer Science<br>Date: Aug 2018       |
| 22. | Nkiruka Uzuegbunam<br>Role: member<br>Title: Self-Image Multimedia Technologies for Feedforward Observational Learning                            | Degree: Ph.D., Electrical Engineering<br>Date: Oct 2018 |
| 23. | Nam Vo (Georgia Institute of Technology)<br>Role: member<br>Title: Image Geolocalization with Deep Learning                                       | Degree: Ph.D., Computer Science<br>Date: May 2019       |

24. Jinping Zhuge  
Role: outside examiner  
Title: Boundary layers in periodic homogenization  
Degree: Ph.D., Math  
Date: May 2019

25. Ryan Zembrodt  
Role: member  
Title: Open-World Story Generation with Sequence-to-Sequence and Hierarchical Recurrent Encoder-Decoder Models  
Degree: M.S., Computer Science  
Date: May 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: May 2019

27. Genghis Goodman  
Role: member  
Title: A Machine Learning Approach to Artificial Floorplan Generation  
Degree: M.S., Computer Science  
Date: Jul 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: Dec 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: Apr 2020

33. Subash Khanal  
Role: member  
Title: Mispronunciation Detection and Diagnosis in Mandarin Accented English Speech  
Degree: M.S., Electrical Engineering  
Date: May 2020

34. Narjes Bozorg  
Role: member  
Title: Articulatory-Wavenet: Deep Autoregressive Model for Acoustic-to-Articulatory Inversion  
Degree: Ph.D., Electrical Engineering  
Date: Nov 2020

35. Céline Portenier (University of Bern)  
Role: external referee  
Title: High-resolution snow cover retrieval using public webcams  
Degree: Ph.D., Computer Science  
Date: May 2021

36. Ahmed Nassar (IRISA, Université Bretagne Sud, Vannes)  
Role: external referee  
Title: Learning to map street-side objects using multiple views  
Degree: Ph.D., Computer Science  
Date: May 2021

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

47. Zihao Zou  
Role: member  
Title: Deep Model-Based Architectures using Explicit Regularizers for Computational Imaging

48. Ashutosh Timilsina  
Role: member  
Title: Peer-to-peer Energy Trading in Smart Residential Environment with User Behavioral Modeling

49. Nan Huang  
Role: member  
Title: Toward Continuous Regularizer for Imaging Inverse Problems

50. Md Selim  
Role: member  
Title: Deep Learning Models for CT Image Standardization

51. Di Huang	Degree: M.S., Computer Science Date: Apr 2023
Role: member	
Title: Deep Neural Networks for Infant Pose Estimation	
52. Peizhen Tong	Degree: M.S., Computer Science Date: Apr 2023
Role: member	
Title: Adversarial Patch Attacks on Deep Reinforcement Learning	
53. David Sarpong	Degree: M.S., Computer Science Date: May 2023
Role: member	
Title: Adversarial Defenses against Interpolation Attacks on Semi-Supervised Learning Systems	
54. Yihang Xu	Degree: M.S., Computer Science Date: May 2023
Role: member	
Title: Real-Time Action Segmentation in a Smart Kitchen System	
55. Stephen Parsons	Degree: Ph.D., Computer Science Date: Jul 2023
Role: member	
Title: Hard-Hearted Scrolls: A Noninvasive Method for Reading the Herculaneum Papyri	
56. Brian Chao	Degree: M.S., Computer Science Date: Aug 2023
Role: member	
Title: Adversarial Attacks on AI Systems in Medical Applications	
57. Chang Ti	Degree: M.S., Computer Science Date: Dec 2023
Role: member	
Title: Handwritten Digit Recognition Web Plugin	
58. Emma McMillian	Degree: M.S., Computer Science Date: Dec 2023
Role: member	
Title: Convolutional Neural Networks for Hyperspectral Image-to-Image Microscopy Translation	
59. Fiona Xu	Degree: M.S., Computer Science Date: Dec 2023
Role: member	
Title: Adversarial Attack on Graph Embeddings from Text Dataset	
60. Kyle Montgomery	Degree: M.S., Computer Science Date: Apr 2024
Role: member	
Title: Exploring the Reasoning Abilities of Large Language Models	
61. Joshua Tang	Degree: M.S., Computer Science Date: Apr 2024
Role: member	
Title: Autonomous Vehicle Object Classification with Uncertainty	
62. Patrick Lynch	Degree: M.S., Computer Science Date: Apr 2024
Role: member	
Title: An Automated System for Detecting Errors in Oatmeal-Making Research Task	
63. Owen Ma	Degree: M.S., Computer Science Date: Dec 2024
Role: member	
Title: Towards Verified Vision-Based Neural Network Controllers for Autonomous Lane-Following	
64. Minoo Hosseinzadeh	Degree: Ph.D., Computer Science Date: Dec 2024
Role: member	
Title: Smart QoS-Aware Resource Management For Edge Intelligence Systems	

65. Junlin Wu	Degree: Ph.D., Computer Science Date: Spring 2025
Role: member	
Title: Trustworthy Autonomy Through Robust Control and Alignment	
66. Evin Jaff	Degree: M.S., Computer Science Date: Dec 2024
Role: member	
Title: SwiftFake: Real-Time Defense Against Deepfake Calls	
67. Yin Li	Degree: M.S., Computer Science Date: Dec 2024
Role: member	
Title: 3D Analysis of Spatial Transcriptome	
68. Sizhe Zhang	Degree: A.M., Statistics Date: Dec 2024
Role: member	
Title: ProofTutor: LLM-based formal math proving model	
69. Ye Htet	Degree: Ph.D., Computer Science Date: Dec 2024
Role: member	
Title: System Design and Task Scheduling for Real-Time Scientific Sensing Applications in Space	
70. Zifan Wang	Degree: M.S., Computer Science Date: Spring 2025
Role: member	
Title: GCHP Workload Balancing	
71. Yuxuan Yang	Degree: M.S., Computer Science Date: Spring 2025
Role: member	
Title: Training Safety Filters for Safe Control with Partial Observed and Un-labeled Data	
72. Haris Naveed	Degree: M.S., Computer Science Date: Spring 2025
Role: chair	
Title: Deep Leraning for Tree Canopy Height Estimation	
73. Sheng-Chieh Lin (University of Kentucky)	Degree: Ph.D., Physics Date: Spring 2025
Role: member	
Title: Machine Learning for Mapping and Understanding Galaxy Clusters	
74. Hao Liu	Degree: Ph.D., Computer Science Date: Spring 2025
Role: member	
Title: Toward Graph Foundation Models: Few-shot and Zero-shot Learning on Graphs	
75. Sidrah Liaqat (University of Kentucky)	Degree: Ph.D., Electrical Engineering Date: TBD
Role: member	
Title: Model-based Deep Learning Techniques for Detecting Behaviors Related to Autism Spectrum Disorder from Video	
76. Gustavo Gratacós	Degree: Ph.D., Computer Science Date: TBD
Role: member	
Title: TBD	
77. Pan Xiao	Degree: Ph.D., Imaging Science Date: TBD
Role: member	
Title: Text and Image Representation Learning for Radiology Image Analysis	
78. Nischal Khanal	Degree: Ph.D., Imaging Science Date: TBD
Role: member	
Title: Cortical Motor Programs as Biomarkers for Functional Impairment and Recovery After Stroke	

79. Christoph Gerhardt (Technische Universität Ilmenau)	Degree: Ph.D., Computer Science
Role: member	Date: TBD
Title: Outdoor Appearance Transfer	
80. Weijie Gan	Degree: Ph.D., Computer Science
Role: member	Date: TBD
Title: Deep Learning-based Computational Imaging	
81. Anindya Sarkar	Degree: Ph.D., Computer Science
Role: member	Date: TBD
Title: TBD	
82. Rachel Badzioch (Notre Dame University)	Degree: Ph.D., Biological Sciences
Role: member	Date: TBD
Title: Detecting Visual Features in Permafrost	
83. Yiwen Ju	Degree: Ph.D., Computer Science
Role: member	Date: TBD
Title: Implicit Surface Reconstruction	
84. Ruiqi Wang	Degree: Ph.D., Computer Science
Role: member	Date: TBD
Title: Real-time and Embedded Systems and Efficient Human Activity Recognition	
85. Kyle Wolford	Degree: M.S., Computer Science
Role: member	Date: Spring 2025
Title: Enhancing Plug-and-Play Image Registration via Diffusion	
86. Je-Hoon Michael Oh	Degree: Ph.D., Computational Systems Biology
Role: member	Date: TBD
Title: TBD	
87. Morris Alper (Tel Aviv University)	Degree: Ph.D., Computer Science
Role: member	Date: TBD
Title: TBD	
88. Tri Pham	Degree: Ph.D., Computer Science
Role: member	Date: TBD
Title: Adaptive Historical Context: Granular Activity Tracking for Interruption Recovery in Software Development	
89. 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	
90. Evelyn Yang	Degree: Ph.D., CSE
Role: member	Date: TBD
Title: TBD	
91. Aadarsha Gopala Reddy	Degree: M.S., CSE
Role: member	Date: TBD
Title: TBD	
92. Weining Wang	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	Jiaxin Huang
Peter Rong	Spring 2025	Tao Ju