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Areas of Expertise

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

Contents

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) *Summa Cum Laude* with Honors	University of Missouri

2 Appointments and Affiliations

Active

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

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

Prior

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

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] 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*, Sep. 2024. arXiv: 2409.16252 [cs.CV].

[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].

[3] 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].

[4] Z. Xiong, X. Xing, S. Workman, S. Khanal, and N. Jacobs, *Mixed-view panorama synthesis using geospatially guided diffusion*, Jul. 2024. arXiv: 2407.09672 [cs.CV].

[5] S. Sastry, X. Xing, A. Dhakal, S. Khanal, A. Ahmad, and N. Jacobs, *LD-SDM: Language-driven hierarchical species distribution modeling*, Dec. 2023. arXiv: 2312.08334 [cs.CV].

Refereed Conference Papers

[1] 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].

[2] 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].

[3] 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. arXiv: 2408.07050 [cs.CV].

[4] 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].

[5] 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.

[6] 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.

[7] 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.

[8] 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.

[9] 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.

[10] 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.

[11] 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.

[12] 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.

[13] X. Xing, C. Peng, Y. Zhang, A.-L. Lin, and N. Jacobs, "AssocFormer: Association transformer on multi-label classification," in *British Machine Vision Conference (BMVC)*, Nov. 2022.

[14] 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.

[15] 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.

[16] 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.

[17] 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.

[18] Y. Zhang, G. Liang, and N. Jacobs, "Dynamic feature alignment for semi-supervised domain adaptation," in *British Machine Vision Conference (BMVC)*, Nov. 2021.

[19] 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.

[20] 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.

[21] 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.

[22] G. Liang, Y. Zhang, X. Wang, and N. Jacobs, "Improved trainable calibration method for neural networks," in *British Machine Vision Conference (BMVC)*, Sep. 2020.

[23] 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.

[24] 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.

[25] 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.

[26] 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.

[27] 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.

[28] 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.

[29] 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.

[30] 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.

[31] 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.

[32] 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.

[33] D. Jones, J. Bopaiah, F. Alghamedy, N. Jacobs, H. Weiss, W. A. D. Jong, and S. Ellingson, "Polypharmacology within the full kinome: A machine learning approach," in *AMIA Informatics Summit*, 2018.

[34] 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.

[35] 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.

[36] 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.

[37] 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.

[38] 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.

[39] 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.

[40] 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.

[41] 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.

[42] 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.

[43] 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.

[44] 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.

[45] 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.

[46] 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.

[47] 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.

[48] 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.

[49] S. Workman, M. Zhai, and N. Jacobs, "Horizon lines in the wild," in *British Machine Vision Conference (BMVC)*, Acceptance rate: 39.4%, 2016.

[50] 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.

[51] 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.

[52] 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.

[53] 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.

[54] 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.

[55] S. Workman, R. Souvenir, and N. Jacobs, "Wide-area image geolocalization 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.

[56] 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.

[57] 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.

[58] R. P. Mihail, G. Blomquist, and N. Jacobs, "A CRF approach to fitting a generalized hand skeleton model," in *IEEE Winter Conference on Applications of Computer Vision (WACV)*, Acceptance rate: 40%, 2014, pp. 409–416. DOI: 10.1109/WACV.2014.6836070.

[59] F. Shi, M. Zhai, D. Duncan, and N. Jacobs, "MPCA: EM-based PCA for mixed-size image datasets," in *IEEE International Conference on Image Processing (ICIP)*, Acceptance rate: 40%, 2014, pp. 1807–1811. DOI: 10.1109/ICIP.2014.7025362.

[60] A. Whitney, J. Fessler, J. Parker, and N. Jacobs, "Received signal strength indication signature for passive UHF tags," in *IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)*, 2014, pp. 1183–1187. DOI: 10.1109/AIM.2014.6878242.

[61] S. Workman, R. P. Mihail, and N. Jacobs, "A Pot of Gold: Rainbows as a calibration cue," in *European Conference on Computer Vision (ECCV)*, Acceptance rate: 25%, 2014, pp. 820–835. DOI: 10.1007/978-3-319-10602-1_53.

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[63] N. Jacobs, M. T. Islam, and S. Workman, "Cloud motion as a calibration cue," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Acceptance rate: 26.2%, 2013, pp. 1344–1351. DOI: 10.1109/CVPR.2013.177.

[64] N. Jacobs, S. Workman, and R. Souvenir, "Scene geometry from several partly cloudy days," in *ACM/IEEE International Conference on Distributed Smart Cameras (ICDSC)*, 2013, pp. 1–6. DOI: 10.1109/ICDSC.2013.6778227.

[65] R. P. Mihail, J. Goldsmith, N. Jacobs, and J. Jaromczyk, "Teaching graphics for games using Microsoft XNA," in *International Conference on Computer Games (CGAMES)*, Best Student Paper Award (runner-up), 2013, pp. 36–40. DOI: 10.1145/2538862.2538898.

[66] M. Dixon, A. Abrams, N. Jacobs, and R. Pless, "On analyzing video with very small motions," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Acceptance rate: 26.4%, 2011, pp. 1–8. DOI: 10.1109/CVPR.2011.5995703.

[67] N. Jacobs, B. Bies, and R. Pless, "Using cloud shadows to infer scene structure and camera calibration," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Acceptance rate: 4.5% (oral), Jun. 2010, pp. 1102–1109. DOI: 10.1109/CVPR.2010.5540093.

[68] N. Jacobs, S. Schuh, and R. Pless, "Compressive sensing and differential image motion estimation," in *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Acceptance rate = 10% (oral), Mar. 2010, pp. 718–721. DOI: 10.1109/ICASSP.2010.5495053.

[69] A. Abrams, N. Fridrich, N. Jacobs, and R. Pless, "Participatory integration of live webcams into GIS," in *International Conference on Computing for Geospatial Research and Applications (COM.GEO)*, (oral), 2010, pp. 1–8. DOI: 10.1145/1823854.1823867.

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[73] N. Jacobs, N. Roman, and R. Pless, "Consistent temporal variations in many outdoor scenes," in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Acceptance rate: 23.4%, Jun. 2007, pp. 1–6. DOI: 10.1109/CVPR.2007.383258.

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Journal Articles

[1] S. J. Hormozabad, N. Jacobs, and M. G. Soto, "Reinforcement learning for integrated structural control and health monitoring," *Practice Periodical on Structural Design and Construction*, vol. 29, no. 3, Aug. 2024. DOI: 10.1061/PPSCFX.SCENG-1455.

[2] S. Shen, C. Li, A. van Donkelaar, N. Jacobs, C. Wang, and R. V. Martin, "Enhancing global estimation of fine particulate matter concentrations by including geophysical a priori information in deep learning," *ACS ES&T Air*, Mar. 2024. DOI: 10.1021/acsestair.3c00054.

[3] A. Levering, D. Marcos, N. Jacobs, and D. Tuia, "Prompt-guided and multimodal landscape scenicness assessments with vision-language models," *PLOS ONE*, 2024.

[4] G. Liang, J. Zulu, X. Xing, and N. Jacobs, "Unveiling roadway hazards: Enhancing fatal crash risk estimation through multi-scale satellite imagery and self-supervised cross-matching," *Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS)*, Nov. 2023. DOI: 10.1109/JSTARS.2023.3331438.

[5] X. Xing, G. Liang, C. Wang, N. Jacobs, and A.-L. Lin, "Self-supervised learning application on covid-19 chest x-ray image classification using masked autoencoder," *Bioengineering*, vol. 10, no. 8, 2023, ISSN: 2306-5354. DOI: 10.3390/bioengineering10080901.

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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 Truszczynski, 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. *Google Cloud Compute Research Credits* — PI: **Nathan Jacobs**
   Sponsor: Google — Amount/Value: $5,000 — Date: Aug 2018

2. *NVIDIA Titan X GPU* — PI: **Nathan Jacobs**
   Sponsor: NVIDIA — Amount/Value: $778 — Date: Oct 2016

3. *AWS Research Education Grant* — PI: **Nathan Jacobs**
   Sponsor: Amazon — Amount/Value: $5,000 — Date: Jul 2015

4. *NVIDIA Tesla K40 GPU* — PI: **Nathan Jacobs**
   Sponsor: NVIDIA — Amount/Value: $3,900 — Date: Dec 2014

6 Talks

1. "Learning to Map Anything, Anywhere, Anytime" (keynote), Nov 2023, The International Conference on Digital Image Computing: Techniques and Applications (DICTA), Port Macquarie, Australia

2. "Learning to Map Anything, Anywhere, Anytime" (keynote), Oct 2023, ACM Multimedia Workshop (UAVs in Multimedia: Capturing the World from a New Perspective), Ottawa, Canada

3. "A Cost-Sensitive Approach To Dimensionality Reduction for Multispectral Imagery", Jul 2023, International Geoscience and Remote Sensing Symposium, Pasadena, CA

4. "Explorations in Self-Supervised Learning for Change Detection", Jul 2023, International Geoscience and Remote Sensing Symposium, Pasadena, CA

5. "Toward Dynamic Multimodal Remote Sensing: From Buildings and Populations to Soundscapes and Aesthetics", Apr 2023, Living Earth Collaborative, Washington University, St. Louis, MO

6. "Domain-Inspired Deep Learning for Computer Vision, Remote Sensing, and Medical Imaging", Oct 2022, Imaging Science Seminar, Washington University, St. Louis, MO

7. "Computer Vision for Multimodal Remote Sensing", Aug 2022, WashU Geospatial Working Group Research Workshop, Washington University, St. Louis, MO

8. "A Structure-Aware Method for Direct Pose Estimation", Jan 2022, IEEE Winter Conference on Applications of Computer Vision (WACV), Waikoloa Village, HI

9. Panelist for "Non-Traditional Careers in Computer Science" Nov 2021, ACM-W, University of Kentucky, Lexington, KY

10. "Mapping the Visual World Using Webcams, Cell Phones, and Satellites", Oct 2021, Washington University in St. Louis, MO

11. "Learning Geo-Temporal Scene Models from Webcams, Cell Phones, and Satellites" (Keynote), Oct 2021, International Workshop on Distributed Smart Cameras, an ICCV Workshop (virtual)

12. "Mapping the Visual World Using Webcams, Cell Phones, and Satellites", Dec 2020, University of Campinas, Unicamp, Brazil (virtual)

13. "Exploring the Intersection of Localization, Mapping, and Image Understanding" (Keynote), Aug 2020, ECCV Workshop on Long-Term Visual Localization (virtual)

14. "Deep Convolutional Neural Networks: Foundations to Frontiers (a 2-day short course)", Mar 2020, Brazilian Space Agency (INPE), Sao Jose dos Campos, Brazil

15. "What, Where, and When: Mapping the World Using Webcams, Cell Phones, and Satellites", Mar 2020, Brazilian Space Agency (INPE), Sao Jose dos Campos, Brazil

16. "Learning to Map Visual Appearance", Feb 2020, Keeping Current Seminar, University of Kentucky (Computer Science), Lexington, KY

17. "Learning to Map Visual Appearance", Jan 2020, Wageningen University, Netherlands

18. "What, Where, and When: Mapping the World Using Webcams, Cell Phones, and Satellites", Nov 2019, University of Kentucky (Forestry), Lexington, KY

19. "Learning to Map the Visual World", Jul 2019, Wright State University, Dayton, OH

20. "Understanding Places Using Ground-Level and Overhead Views" (Keynote), May 2019, Kentucky Geological Society (Annual Symposium), Lexington, KY

21. "Understanding Places Using Ground-Level and Overhead Views", Feb 2019, Notre Dame University, South Bend, IN

22. "A Generative Model of Worldwide Facial Appearance" (Keynote), Jan 2019, Workshop on Demographic Variations in Performance of Biometric Algorithms, Waikoloa Village, HI

23. "A Generative Model of Worldwide Facial Appearance", Jan 2019, IEEE Winter Conference on Applications of Computer Vision, Waikoloa Village, HI

24. "A Weakly Supervised Approach for Estimating Spatial Density Functions from High-Resolution Satellite Imagery", Nov 2018, ACM SIGSPATIAL, Seattle, WA

25. "Understanding Places Using Ground-Level and Overhead Views", Oct 2018, Commonwealth Computational Summit, Lexington, KY

26. "GeoLookbook: Modeling Worldwide Human Visual Appearance (Year 4)", Sep 2018, National Academy of Sciences (IC Academic Research Symposium), Washington, DC

27. "Understanding Places Using Ground-Level and Overhead Views", Aug 2018, Oak Ridge National Lab, Oak Ridge, TN

28. "WhatGoesWhere: Predicting Object Distributions from Above", Jul 2018, IGARSS, Valencia, Spain

29. "Building World Models for Situated Training and Planning", May 2018, Air Force Science and Technology 2030 Workshop, Bloomington, IN

30. "Recent Advances in Image Understanding", May 2018, DASC, Lexington, KY

31. "(Tutorial) Recent Advances in Deep Learning: Fusing Overhead and Ground-Level Views for Remote Sensing", April 2018, USGIF Annual Symposium, Tampa, FL

32. "Understanding Places Using Ground-Level and Overhead Views", Feb 2018, CVPR Area Chair Meeting, Toronto, Canada

33. "GeoLookbook: Modeling Worldwide Human Visual Appearance (Year 3)", Sep 2017, National Academy of Sciences (IC Academic Research Symposium), Washington, DC

34. "GPU Accelerated Computer Vision, Remote Sensing, and Machine Learning", Aug 2017, Kentucky Geological Service, Lexington, KY

35. "Fusing Overhead and Ground-Level Imagery to Improve Scene Understanding", Jul 2017, Planet, San Francisco, CA

36. "Learning about When and Where from Imagery", Jun 2017, Orbital Insight, Mountain View, CA

37. "(Tutorial) Recent Advances in Deep Learning: Fusing Overhead and Ground-Level Views for Remote Sensing", Jun 2017, USGIF Annual Symposium, San Antonio, TX

38. "How Computers See People (extended)", May 2017, CCTS Biomedical Informatics Seminar Series, Lexington, KY

39. "Understanding Places Using Ground-Level and Overhead Views", May 2017, Midwest Vision Meeting, Chicago, IL

40. "How Computers See People", Feb 2017, Suds'n'Science Speaker Series, West Sixth Brewing, Lexington, KY

41. "Learning about When and Where from Imagery", Feb 2017, University of Missouri, Department of Computer Science

42. "Localization, Mapping, and Image Understanding", Feb 2017, USGIF Machine Learning Symposium

43. "Deep Convolutional Neural Networks: Concepts and Examples (in Computer Vision", Nov 2016, University of Kentucky, Society of Industrial and Applied Mathematics

44. "Crossview Convolutional Networks", Oct 2016, Applied Imagery and Pattern Recognition, Washington, D.C.

45. "GeoLookbook: Modeling Worldwide Human Visual Appearance (Year 2)", Sep 2016, National Academy of Sciences (IC Academic Research Symposium), Washington, DC

46. "Deep Convolutional Neural Networks: Concepts and Examples", Jul 2016, University of Kentucky: Systems Biology and Omics Integration Seminar

47. "Crossview Methods for Localization and Mapping", Jun 2016, IEEE CVPR Workshop on "Vision from Satellite to Street" (invited talk)

48. "A Fast Method for Estimating Transient Scene Properties", Mar 2016, Winter Conference on Applications of Computer Vision, Lake Placid, NY

49. "Novel Cues for Geocalibration", Feb 2016, Indiana University, Bloomington, IN

50. "Novel Cues for Camera Geocalibration", Jan 2016, Uber Advanced Technology Center, Pittsburgh, PA

51. "Novel Cues for Geocalibration: Cloudy Days, Rainbows, and More", Oct 2015, Carnegie Mellon University, Pittsburgh, PA

52. "Using Geotagged Internet Imagery to Understand the World", Sep 2015, Université Laval, Quebec City, Canada

53. "face2gps: Estimating Geographic Location from Facial Features", Sep 2015, International Conference on Image Processing, Quebec City, Canada

54. "GeoLookbook: Modeling Worldwide Human Visual Appearance", Sep 2015, National Academy of Sciences (IC Academic Research Symposium), Washington, DC

55. "Exploring the Geo-Dependence of Human Face Appearance", Mar 2014, Winter Conference on Applications of Computer Vision, Steamboat Springs, CO

56. "Estimating Cloudmaps from Outdoor Image Sequences", Mar 2014, Winter Conference on Applications of Computer Vision, Steamboat Springs, CO

57. "Scene Geometry from Several Partly Cloudy Days", Oct 2013, International Conference on Distributed Smart Cameras, Palm Springs, CA

58. "Unlocking the Potential of the Global Network of Outdoor Webcams", Apr 2013, Rochester Institute of Technology

59. "Geo-temporal Computer Vision: Applications to the NGA", Nov 2011, National Geospatial-Intelligence Agency

60. "Geo-temporal Computer Vision: Applications to the Army", Oct 2011, Army Research Lab

61. "Localizing, Calibrating, and Using Thousands of Outdoor Webcams", Feb 2011, University of North Carolina–Charlotte

62. "Using Clouds Shadows to Infer Scene Structure and Camera Calibration", Jun 2010, CVPR, San Francisco, CA

63. "Passive Vision and The Power of Collective Imaging", Apr 2010, Object Video Inc., Reston, VA

64. "Localizing, Calibrating, and Using Thousands of Outdoor Webcams", Apr 2010, University of Kentucky

65. "Time-Lapse Vision: Localizing, Calibrating, and Using Thousands Outdoor Webcams", Apr 2010, Google, Mountain View, CA

66. "Passive Vision and The Power of Collective Imaging", Jan 2010, Google, Mountain View, CA

67. "Incorporating Domain Constraints in Urban Vehicle Tracking", Nov 2010, University of Missouri, Columbia, MO

68. "Compressive Sensing and Differential Image-Motion Estimation", Mar 2010, ICASSP, Dallas, TX

69. "The Global Network of Outdoor Webcams: Properties and Applications ", Nov 2009, ACM GIS, Seattle, WA

70. "Passive Vision: The Global Webcam Imaging Network", Oct 2009, AIPR, Washington, DC

71. "Calibrating and Using the Global Network of Outdoor Webcams", Aug 2009, ICDSC, Italy

72. "Adventures in Archiving and Using Three Years of Webcam Images", Jun 2009, CVPR Workshop on Internet Vision, Miami, FL

73. "Recent Work: Webcams and Grooves", Aug 2009, Object Video, Reston, VA

74. "Location-Specific Models for Tracking", Jan 2008, WMVC, Copper Mountain, CO

75. "Using natural cues to geo-locate and geo-orient distributed cameras", Jan 2008, VISN, Copper Mountain, CO

76. "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

- Senior/Lead Area Chair:

    - IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) [2024]
    - European Conference on Computer Vision (ECCV) [2024]

- Area Chair:

    - IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) [2018, 2019, 2021, 2023, 2025]

- European Conference on Computer Vision (ECCV) [2022]
  - IEEE/CVF International Conference on Computer Vision (ICCV) [2023]
  - Conference on Neural Information Processing Systems (NeurIPS) [2024]
  - IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) [2014, 2022, 2023]

- Organizing Committees:

  - 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, 2020, 2021, 2022, 2023, 2025]
  - Doctoral Consortium Co-Chair: IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) [2017, 2019, 2024]
  - 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]
  - IEEE/ACM International Conference on Distributed Smart Cameras [2013]

- Reviewing for Journals:

  - 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, 2011, 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, 2008, 2009, 2010, 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]
    * 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 (EARTHVI-SION) [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:

- *Computer Vision*, CSE 559a, [S2023], 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

The following list summarizes the independent study courses (UKy CS 395 or 612) I have supervised:

- F2019, "Applied Deep Learning"

- S2019, "Applied Deep Learning" ($\times 5$)

- F2018, "Applied Deep Learning" ($\times 5$)

- S2018, "Applied Deep Learning" ($\times 4$)

- F2017, "Applied Deep Learning"

- F2016, "Applied Deep Learning" ($\times 6$)

- S2016, "Applied Deep Learning: Understanding Urban Areas"

- S2015, "Understanding Real-Estate Imagery"

- F2014, "Recent Techniques in Machine Learning" ($\times 4$)

- F2014, "Learning-Based Methods for Background Subtraction"

- F2014, "A Novel Approach for Category-Level Object Detection from Partial Pose Estimation of Symmetric Objects"

- S2013, "Extracting Geo-Temporal Image Appearance Patterns from Flickr Imagery"

- S2013, "Automatic Camera Calibration Methods"

- S2013, "Deep-Learning Architectures for Computer Vision"

- F2012, "Automatic Image Geolocalization"

- S2012, "Image Calibration using Natural Scene Variations"

- F2011, "Practical Methods in Crowd Sourcing"

Mentoring

Postdoctoral Scholars

1. Adeel Ahmad (Ph.D. Geomatics, University of Punjab–Lahore)   Dates: 2023–present
   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* w/ Judy Goldsmith]   Degree: Ph.D., Computer Science
   Title: Visualizing and Predicting the Effects of Rheumatoid Arthritis on Hands   Date: May 2014
   Employment: Associate 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* w/ 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
    Title: Probabilistic Cross-Domain Representation Learning — Date: Jun 2022
    Employment: Senior R&D Engineer, Kitware Inc.

12. Yu Zhang — Degree: Ph.D., Computer Science
    Title: Multimodal Domain Generalization — Date: Mar 2023

13. Xin Xing [*co-chair* w/ Ai-Ling Lin] — Degree: Ph.D., Computer Science
    Title: Structured Attention for Image Analysis — Date: Nov 2023

14. Subash Khanal — Degree: Ph.D., Computer Science
    Title: TBD — Date: Jun 2024 (est)

15. Oscar Skean [*co-chair* w/ Luis Sanchez-Giraldo] — Degree: Ph.D., Computer Science
    Title: TBD [Information-Theoretic Metric Learning] — Date: May 2024 (est)

16. Aayush Dhakal — Degree: Ph.D., Computer Science
    Title: TBD — Date: May 2026 (est)

17. Lydia Reader [*co-chair* w/ Ross Hammond] — Degree: Ph.D., Computational & Data Sciences
    Title: TBD — Date: May 2026 (est)

18. Srikumar Sastry — Degree: Ph.D., Imaging Science
    Title: TBD — Date: May 2027 (est)

19. Michael Lanier [*co-chair* w/ Yevgeniy Vorobeychik] — Degree: Ph.D., Computer Science
    Title: TBD — Date: May 2027 (est)

20. Zhexiao Xiong — Degree: Ph.D., Computer Science
    Title: TBD — Date: May 2027 (est)

Visiting Ph.D. Students

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

1. Feiyu Shi   Degree: MS, Computer Science
   Title: Principal Component Analysis For Multi-size Images   Date: Dec 2013
   Employment: Senior Software Engineer, Microsoft

2. Ryan Baltenberger   Degree: MS, Computer Science
   Title: Estimating Transient Scene Attributes Using Deep Convolutional Neural Networks   Date: May 2016
   Employment: Computer Vision Research Engineer, Badger Technologies

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
   Employment: Research Data Scientist, Lawrence Livermore National Laboratory, ATOM

4. Weilian "William" Song   Degree: MS, Computer Science
   Title: Image-Based Roadway Assessment using Convolutional Neural Networks   Date: May 2019
   Employment: Ph.D. student, Simon Fraser University

5. Armin Hadzic   Degree: MS, Computer Science
   Title: Estimating Free-Flow Speed with LiDAR and Overhead Imagery   Date: May 2020
   Employment: Machine Learning Research Scientist, DZYNE Technologies

6. David Jones   Degree: MS, Computer Science
   Title: Intensity Harmonization for Airborne LiDAR   Date: May 2021
   Employment: Machine Learning Engineer, Kinetic Vision

7. Jacob Birge   Degree: MS, Computer Science
   Title: A Cost-Sensitive Approach To Multimodal Fusion   Date: Dec 2021
   Employment: UPS

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. Myan Sudharsanan — Degree: MS, Computer Engineering — Date: May 2025
    Title: Vision-Language Models

13. Lunchi Guo — Degree: MS, Computer Science — Date: May 2025
    Title: Dosimetry Calculations Based on Deep Learning Method

14. Meichuan Yin — Degree: MS, Computer Science — Date: Dec 2024
    Title: BirdSat++

15. Ethan Weilheimer — Degree: MS, Computer Science — Date: May 2025
    Title: TBD

16. Shuhan Zhang — Degree: MS, Computer Science — Date: May 2025
    Title: TBD

17. Jingyun Ma — Degree: MS, Computer Science — Date: May 2025
    Title: TBD

Undergraduate Research Students

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

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

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

8. Nicole Wong — Dates: 2019–2020
   Title: Learning-Based View Synthesis

9. Chris Wang — Dates: 2019–2021
   Title: Multimodal Medical Imaging for Alzheimer's Disease Classification

10. William Greenlee — Dates: 2021–2022
    Title: Deep Learning for Computer Vision

11. Krishna Bhatraju — Dates: 2021–2022
    Title: Deep Motion Estimation

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: Mar 2011

2. Ju Shen
   Role: member
   Title: Computational Multimedia for Video Self Modeling
   Degree: Ph.D., Electrical Engineering
   Date: May 2014

3. Hasan Sajid
   Role: member
   Title: A Universal Background Subtraction System
   Degree: M.S., Electrical Engineering
   Date: Jul 2014

4. Chenxi Zhang
   Role: member
   Title: Depth-assisted Image Segmentation, Enhancement and Visualization
   Degree: Ph.D., Computer Science
   Date: Dec 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: Dec 2014

6. Yan Huang
   Role: member
   Title: Novel Computational Methods for Transcript Reconstruction and Quantification using RNA-SEQ Data
   Degree: Ph.D., Computer Science
   Date: Dec 2014

7. Shaoceng Wei
   Role: outside examiner
   Title: Multi-state Models for Interval Censored Data with Competing Risk
   Degree: Ph.D., Statistics
   Date: May 2015

8. Bo Fu
   Role: member
   Title: Towards Intelligent Telerobotics: Visualization and Control of Remote Robot
   Degree: Ph.D., Computer Science
   Date: May 2015

9. Harikrishnan Unnikrishnan
   Role: member
   Title: Analysis of Vocal Fold Kinematics using High Speed Video
   Degree: Ph.D., Electrical Engineering
   Date: Dec 2015

10. Sean Karlage
    Role: member
    Title: Diachronic Volume Registration for Analysis of Antiquities
    Degree: M.S., Computer Science
    Date: May 2016

11. Hasan Sajid
    Role: member
    Title: Robust Background Subtraction for Moving Cameras and their Applications in Ego-vision Systems
    Degree: Ph.D., Electrical Engineering
    Date: Jul 2016

12. Stanley Rosenbaum
    Role: member
    Title: A method for presenting volume and color of 3D objects via audio for the visually impaired
    Degree: M.S., Computer Science
    Date: Dec 2016

13. DhiShankar Bhattacharya
    Role: member
    Title: Analyzing Sybil Attacks and Similar Phenomena in Twitter Data
    Degree: M.S., Computer Science
    Date: Apr 2017

14. Wesley Hough
    Role: outside examiner
    Title: On Independence, Matching, and Homomorphism Complexes
    Degree: Ph.D., Computer Science
    Date: May 2017

15. Qingguo Xu   Degree: M.S., Computer Science
    Role: member   Date: May 2017
    Title: 3D Body Tracking using Deep Learning

16. Xiaofei Zhang   Degree: M.S., Computer Science
    Role: member   Date: Jul 2017
    Title: Mammogram and Tomosynthesis Classification Using Convolutional Neural Networks

17. Yajie Zhao   Degree: Ph.D., Computer Science
    Role: member   Date: Dec 2017
    Title: 3D Human Face Reconstruction and 2D Appearance Synthesis

18. Po-Chang Su   Degree: Ph.D., Electrical Engineering
    Role: member   Date: Dec 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: Jun 2018
    Title: Deep Neural Networks for Multi-Label Text Classification: Application to Coding Electronic Medical Records

20. Ethan Welty (University of Colorado–Boulder)   Degree: Ph.D., Environmental Studies
    Role: member   Date: Jul 2018
    Title: High-Precision Photogrammetry for Glaciology

21. Yannick Hold-Geoffroy (Laval University, Quebec, CA)   Degree: Ph.D., Computer Science
    Role: member   Date: Aug 2018
    Title: Learning Geometric and Lighting priors from Natural Images

22. Nkiruka Uzuegbunam   Degree: Ph.D., Electrical Engineering
    Role: member   Date: Oct 2018
    Title: Self-Image Multimedia Technologies for Feedforward Observational Learning

23. Nam Vo (Georgia Institute of Technology)   Degree: Ph.D., Computer Science
    Role: member   Date: May 2019
    Title: Image Geolocalization with Deep Learning

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

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

26. Jonathan Dingess   Degree: M.S., Computer Science
    Role: member   Date: May 2019
    Title: Epsilon-Superposition and Truncation Dimension in Average and Probabilistic Settings for Infinite-Variate Linear Problems

27. Genghis Goodman   Degree: M.S., Computer Science
    Role: member   Date: Jul 2019
    Title: A Machine Learning Approach to Artificial Floorplan Generation

28. Xinxin Zuo   Degree: Ph.D., Computer Science
Role: member   Date: Oct 2019
Title: Depth Enhancement and Surface Reconstruction with RGB-D sequence

29. Sifei Han   Degree: Ph.D., Computer Science
Role: member   Date: Dec 2019
Title: Text Mining Methods for Analyzing Online Health Information and Communication

30. Shivangi Srivastava (Wageningen University, Netherlands)   Degree: Ph.D., Computer Science
Role: member   Date: Feb 2020
Title: Mapping of urban landuse and landcover with multiple sensors: joining close and remote sensing with deep learning

31. Raian Maretto (National Institute for Space Research)   Degree: Ph.D., Geoinformation Science
Role: member   Date: Feb 2020
Title: Deep Learning techniques applied to classification of Remote Sensing Images

32. Kyle Helfrich   Degree: Ph.D., Math
Role: member   Date: Apr 2020
Title: Orthogonal Recurrent Neural Networks and Batch Normalization in Deep Neural Networks

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

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

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

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

37. Alireza Shirvani   Degree: Ph.D., Computer Science
Role: member   Date: Aug 2021
Title: Personality and Emotion for Virtual Characters in Strong-story Narrative Planning

38. Sajad Javadinasab Hormozabad   Degree: Ph.D., Civil Engineering
Role: member   Date: Nov 2021
Title: Artificial Intelligence and Soft Computing in Smart Structural Systems

39. Chengxi Li   Degree: Ph.D., Computer Science
Role: member   Date: Mar 2022
Title: Supporting Stylized Language Models using Multi-Modality Features

40. Tarannum Shaila Zaman   Degree: Ph.D., Computer Science
Role: member   Date: Apr 2022
Title: An Automated Framework to Debug System-Level Concurrency Failures

41. David Adeniji   Degree: Ph.D., Mechanical Engineering
Role: member   Date: Apr 2022
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)   Degree: Ph.D., Data Science in Earth Observation
    Role: reviewer   Date: Oct 2022
    Title: Predicting Building Functions on Large Scale by Fusing Social Media and Remote Sensing Data

43. Arnab Sarkar   Degree: Ph.D., Physics
    Role: member   Date: Aug 2022
    Title: Understanding the Physics of Galaxy Clusters Out to their Virial Radii and Beyond

44. Yuan Liu   Degree: M.S., Computer Science
    Role: member   Date: Dec 2022
    Title: Skeleton-Based Analysis of Melt Networks

45. Aiden McIlraith   Degree: M.S., Computer Science
    Role: member   Date: Dec 2022
    Title: Spatial Transcriptome Visualizer

46. Zhou Chu   Degree: M.S., Computer Science
    Role: member   Date: Dec 2022
    Title: Adapting at time series machine learning models to a real informatics pipe

47. Zihao Zou   Degree: M.S., Computer Science
    Role: member   Date: Dec 2022
    Title: Deep Model-Based Architectures using Explicit Regularizers for Computational Imaging

48. Ashutosh Timilsina   Degree: Ph.D., Computer Science
    Role: member   Date: Apr 2023
    Title: Peer-to-peer Energy Trading in Smart Residential Environment with User Behavioral Modeling

49. Nan Huang   Degree: M.S., Computer Science
    Role: member   Date: Apr 2023
    Title: Toward Continuous Regularizer for Imaging Inverse Problems

50. Md Selim   Degree: Ph.D., Computer Science
    Role: member   Date: Apr 2023
    Title: Deep Learning Models for CT Image Standardization

51. Di Huang   Degree: M.S., Computer Science
    Role: member   Date: Apr 2023
    Title: Deep Neural Networks for Infant Pose Estimation

52. Peizhen Tong   Degree: M.S., Computer Science
    Role: member   Date: Apr 2023
    Title: Adversarial Patch Attacks on Deep Reinforcement Learning

53. David Sarpong   Degree: M.S., Computer Science
    Role: member   Date: May 2023
    Title: Adversarial Defenses against Interpolation Attacks on Semi-Supervised Learning Systems

54. Yihang Xu   Degree: M.S., Computer Science
    Role: member   Date: May 2023
    Title: Real-Time Action Segmentation in a Smart Kitchen System

55. Stephen Parsons   Degree: Ph.D., Computer Science
    Role: member   Date: Jul 2023
    Title: Hard-Hearted Scrolls: A Noninvasive Method for Reading the Herculaneum Papyri

56. Brian Chao
    Role: member
    Title: Adversarial Attacks on AI Systems in Medical Applications

    Degree: M.S., Computer Science
    Date: Aug 2023

57. Chang Ti
    Role: member
    Title: Handwritten Digit Recognition Web Plugin

    Degree: M.S., Computer Science
    Date: Dec 2023

58. Emma McMillian
    Role: member
    Title: Convolutional Neural Networks for Hyperspectral Image-to-Image Microscopy Translation

    Degree: M.S., Computer Science
    Date: Dec 2023

59. Fiona Xu
    Role: member
    Title: Adversarial Attack on Graph Embeddings from Text Dataset

    Degree: M.S., Computer Science
    Date: Dec 2023

60. Md Sultan Al Nahian
    Role: member
    Title: Value Aligned AI Agent with Explainability

    Degree: Ph.D., Computer Science
    Date: TBD

61. Sidrah Liaqat
    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

62. Minoo Hosseinzadeh
    Role: member
    Title: TBD

    Degree: Ph.D., Computer Science
    Date: TBD

63. Sheng-Chieh Lin
    Role: member
    Title: TBD

    Degree: Ph.D., Physics
    Date: TBD

64. Seth Parker
    Role: member
    Title: TBD

    Degree: Ph.D., Computer Science
    Date: TBD

65. Gustavo Gratacós
    Role: member
    Title: TBD

    Degree: Ph.D., Computer Science
    Date: TBD

66. Pan Xiao
    Role: member
    Title: Text and Image Representation Learning for Radiology Image Analysis

    Degree: Ph.D., Imaging Science
    Date: TBD

67. Christoph Gerhardt (Technische Universität Ilmenau)
    Role: member
    Title: Outdoor Appearance Transfer

    Degree: Ph.D., Computer Science
    Date: TBD

68. Weijie Gan
    Role: member
    Title: Deep Learning-based Computational Imaging

    Degree: Ph.D., Computer Science
    Date: TBD

69. Hao Liu
    Role: member
    Title: Graph Neural Networks in Limited Data Regimes: Exploring Few-Shot and Zero-Shot Learning

    Degree: Ph.D., Computer Science
    Date: TBD

70. Junlin Wu
    Role: member
    Title: TBD

    Degree: Ph.D., Computer Science
    Date: TBD

71. Rachel Badzioch (Notre Dame University)
    Role: member
    Title: Detecting Visual Features in Permafrost

    Degree: Ph.D., Biological Sciences
    Date: TBD

72. Yiwen Ju
    Role: member
    Title: Implicit Surface Reconstruction

    Degree: Ph.D., Computer Science
    Date: TBD

73. Ruiqi Wang
    Role: member
    Title: Real-time and Embedded Systems and Efficient Human Activity Recognition

    Degree: Ph.D., Computer Science
    Date: TBD

74. Kyle Montgomery
    Role: member
    Title: Exploring the Reasoning Abilities of Large Language Models

    Degree: M.S., Computer Science
    Date: Apr 2024

75. Joshua Tang
    Role: member
    Title: Autonomous Vehicle Object Classification with Uncertainty

    Degree: M.S., Computer Science
    Date: Apr 2024

76. Patrick Lynch
    Role: member
    Title: An Automated System for Detecting Errors in Oatmeal-Making Research Task

    Degree: M.S., Computer Science
    Date: Apr 2024

77. Lydia Reader
    Role: member
    Title: TBD

    Degree: Ph.D., Data Science
    Date: TBD

Oral Qualifying Exam Committees

Student	Date	Advisor
Junlin Wu	Dec 2022	Eugene Vorobeychik
Yiwen Ju	Apr 2023	Tao Ju
Yuanhaur Chang	TBD	Ning Zhang
Han Liu	TBD	Ning Zhang
Jiarui Feng	TBD	Yixin Chen