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

Prior

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

3   Awards

- 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] M. Lanier, Y. Xu, N. Jacobs, C. Zhang, and Y. Vorobeychik, *Learning interpretable policies in hindsight-observable POMDPs through partially supervised reinforcement learning*, 2024. arXiv: 2402.09290 [cs.LG].

[2] 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].

[3] O. Skean, A. Dhakal, N. Jacobs, and L. G. S. Giraldo, *FroSSL: Frobenius norm minimization for self-supervised learning*, Oct. 2023. arXiv: 2310.02903 [cs.LG].

Journal Articles

[1] 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.

[2] 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.

[3] 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.

[4] X. Xing, M. U. Rafique, G. Liang, H. Blanton, Y. Zhang, C. Wang, N. Jacobs, and A.-L. Lin, "Efficient training on alzheimer's disease diagnosis with learnable weighted pooling for 3d pet brain image classification," *Electronics*, vol. 12, no. 2, 2023, Impact factor: 2.69. DOI: 10.3390/electronics12020467.

[5] X. X. Zhu, Y. Wang, M. Kochupillai, M. Werner, M. Haberle, E. J. Hoffmann, H. Taubenbock, D. Tuia, A. Levering, N. Jacobs, A. Kruspe, and K. Abdulahhad, "Geoinformation harvesting from social media data: A community remote sensing approach," *IEEE Geoscience and Remote Sensing Magazine*, vol. 10, no. 4, pp. 150–180, Dec. 2022, Impact factor: 8.225. DOI: 10.1109/MGRS.2022.3219584.

[6] G. Liang, H. Ganesh, D. Steffe, L. Liu, N. Jacobs, and J. Zhang, "Development of cnn models for the enteral feeding tube positioning assessment on a small scale data set," *BMC Medical Imaging*, vol. 22, Mar. 2022, ISSN: 1471-2342. DOI: 10.1186/s12880-022-00766-w.

[7] R. Padilha, T. Salem, S. Workman, F. A. Andaló, A. Rocha, and N. Jacobs, "Content-based detection of temporal metadata manipulation," *IEEE Transactions on Information Forensics and Security*, pp. 1316–1327, Mar. 2022. DOI: 10.1109/TIFS.2022.3159154.

[8] S.-C. Lin, Y. Su, G. Liang, Y. Zhang, N. Jacobs, and Y. Zhang, "Estimating cluster masses from SDSS multiband images with transfer learning," *Monthly Notices of the Royal Astronomical Society (MNRAS)*, vol. 512, pp. 3885–3894, 3 Mar. 2022, Impact factor: 5.287. DOI: 10.1093/mnras/stac725.

[9] M. U. Rafique, J. Zhu, and N. Jacobs, "Automatic segmentation of sinkholes using a convolutional neural network," *Earth and Space Science*, p. 19, Dec. 2021, Impact factor: 3.138. DOI: 10.1002/essoar.10509794.1.

[10] G. Liang, C. Greenwell, Y. Zhang, X. Xing, X. Wang, R. Kavuluru, and N. Jacobs, "Contrastive cross-modal pre-training: A general strategy for small sample medical imaging," *IEEE Journal of Biomedical and Health Informatics*, vol. 26, 4 Sep. 2021, Impact factor: 5.223, ISSN: 2168-2184. DOI: 10.1109/JBHI.2021.3110805.

[11] D. Tuia, R. Roscher, J. D. Wegner, N. Jacobs, X. X. Zhu, and G. Camps-Valls, "Towards a collective agenda on ai for earth science data analysis," *IEEE Geoscience and Remote Sensing Magazine*, vol. 9, no. 2, pp. 88–104, Jun. 2021, Impact factor: 8.225. DOI: 10.1109/MGRS.2020.3043504.

[12] J. Zhu, A. Nolte, N. Jacobs, and M. Ye, "Machine learning in identifying karst sinkholes from LiDAR-derived topographic depressions in the Bluegrass region of Kentucky," *Journal of Hydrology*, Sep. 2020, Impact factor: 4.405. DOI: 10.1016/j.jhydrol.2020.125049.

[13] Y. Su, Y. Zhang, G. Liang, J. ZuHone, D. Barnes, N. Jacobs, M. Ntampaka, W. Forman, P. Nulsen, R. Kraft, and C. Jones, "A deep learning view of the census of galaxy clusters in IllustrisTNG," *Monthly Notices of the Royal Astronomical Society (MNRAS)*, Sep. 2020, Impact factor: 5.356. DOI: 10.1093/mnras/staa2690.

[14] T. C. Hammond, X. Xing, C. Wang, D. Ma, K. Nho, P. K. Crane, F. Elahi, D. A. Ziegler, G. Liang, Q. Cheng, L. M. Yanckello, N. Jacobs, and A.-L. Lin, "Beta-amyloid and tau drive early Alzheimer's disease decline while glucose hypometabolism drives late decline," *Communications Biology*, vol. 3, no. 1, p. 352, Jul. 2020, Impact factor: 6.268. DOI: 10.1038/s42003-020-1079-x.

[15] X. Wang, G. Liang, Y. Zhang, H. Blanton, Z. Bessinger, and N. Jacobs, "Inconsistent performance of deep learning models on mammogram classification," *Journal of the American College of Radiology*, Jun. 2020, Impact factor: 3.785. DOI: 10.1016/j.jacr.2020.01.006.

[16] R. V. Maretto, L. M. G. Fonseca, N. B. Jacobs, T. S. Körting, H. N. Bendini, and L. L. Parente, "Spatio-temporal deep learning approach to map deforestation in Amazon rainforest," *IEEE Geoscience and Remote Sensing Letters*, vol. 18, no. 5, pp. 771–775, Apr. 2020, Impact factor: 3.534. DOI: 10.1109/LGRS.2020.2986407.

[17] H. Hamraz, N. B. Jacobs, M. A. Contreras, and C. H. Clark, "Deep Learning for Conifer/Deciduous Classification of Airborne LiDAR 3D Point Clouds Representing Individual Trees," *ISPRS Journal of Photogrammetry and Remote Sensing*, vol. 158, pp. 219–230, Dec. 2019, Impact factor: 6.946, ISSN: 0924-2716. DOI: 10.1016/j.isprsjprs.2019.10.011.

[18] R. P. Mihail, G. Liang, and N. Jacobs, "Automatic hand skeletal shape estimation from radiographs," *IEEE Transactions on NanoBioscience*, vol. 18, no. 3, pp. 296–305, Apr. 2019, Impact factor: 1.927. DOI: 10.1109/TNB.2019.2911026.

[19] H. Sajid, N. Jacobs, and S.-c. S. Cheung, "Motion and appearance based background subtraction for freely moving cameras," *Signal Processing: Image Communication*, 2019, Impact factor: 2.814. DOI: 10.1016/j.image.2019.03.003.

[20] X. Zhang, Y. Zhang, E. Han, N. Jacobs, Q. Han, X. Wang, and J. Liu, "Classification of whole mammogram and tomosynthesis images using deep convolutional neural networks," *IEEE Transactions on NanoBioscience*, Jul. 2018, Impact factor: 1.927. DOI: 10.1109/TNB.2018.2845103.

[21] N. Jacobs, S. Workman, and R. Souvenir, "Cloudmaps from static ground-view video," *Image and Vision Computing (IVC)*, vol. 52, pp. 154–166, Aug. 2016, Impact factor: 1.766. DOI: 10.1016/j.imavis.2016.05.013.

[22] H. Sajid, S.-c. S. Cheung, and N. Jacobs, "Appearance based background subtraction for PTZ cameras," *Signal Processing: Image Communication*, Jul. 2016, Impact factor: 1.602. DOI: 10.1016/j.image.2016.07.008.

[23] M. T. Islam, C. Greenwell, R. Souvenir, and N. Jacobs, "Large-scale geo-facial image analysis," *EURASIP Journal on Image and Video Processing (JIVP)*, vol. 2015, no. 1, pp. 1–14, Jun. 2015, Impact factor: 1.060. DOI: 10.1186/s13640-015-0070-9.

[24] S. Workman, R. Souvenir, and N. Jacobs, "Scene shape estimation from multiple partly cloudy days," *Computer Vision and Image Understanding (CVIU)*, pp. 116–129, Apr. 2015, Impact factor: 1.54. DOI: 10.1016/j.cviu.2014.10.002.

[25] N. Jacobs, A. Abrams, and R. Pless, "Two cloud-based cues for estimating scene structure and camera calibration," *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*, vol. 35, no. 10, pp. 2526–2538, Aug. 2013, Impact factor: 5.694, ISSN: 0162-8828. DOI: 10.1109/TPAMI.2013.55.

[26] N. Jacobs and R. Pless, "Time scales in video surveillance," *IEEE Transactions on Circuits and Systems for Video Technology (CSVT)*, vol. 18, no. 8, pp. 1106–1113, Aug. 2008, Impact factor: 2.615. DOI: 10.1109/TCSVT.2008.928215.

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.

Book Chapters

[1] R. P. Mihail, N. Jacobs, J. Goldsmith, and K. Lohr, "Using visual analytics to inform rheumatoid arthritis patient choices," in *Serious Games Analytics*, ser. Advances in Game-Based Learning, C. S. Loh, Y. Sheng, and D. Ifenthaler, Eds., Springer International Publishing, 2015, pp. 211–231, ISBN: 978-3-319-05833-7. DOI: 10.1007/978-3-319-05834-4_9.

Refereed Conference Papers

[1] 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.

[2] 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.

[3] 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.

[4] 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.

[5] 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.

[6] 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.

[7] 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.

[8] 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.

[9] 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.

[10] 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.

[11] 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.

[12] 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.

[13] 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.

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

[15] 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.

[16] 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.

[17] 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.

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

[19] 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.

[20] 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.

[21] 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.

[22] 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.

[23] 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.

[24] 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.

[25] 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.

[26] 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.

[27] 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.

[28] 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.

[29] 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.

[30] 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.

[31] 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.

[32] 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.

[33] 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.

[34] 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.

[35] 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.

[36] 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.

[37] 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.

[38] 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.

[39] 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`.

[40] 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`.

[41] 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`.

[42] 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`.

[43] 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`.

[44] 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`.

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

[46] 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`.

[47] 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`.

[48] 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`.

[49] 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`.

[50] 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`.

[51] 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`.

[52] 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`.

[53] 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`.

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Datasets

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5 Funding

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]

- IEEE/CVF International Conference on Computer Vision (ICCV) [2023]
- European Conference on Computer Vision (ECCV) [2022]
- 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]
  - 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]
  - 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]
    - * IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) [2021,2024]
    - * 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 (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:

- *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. Meichuan Yin — Degree: MS, Computer Science
    Title: BirdSat++ — Date: May 2024

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   Degree: M.S., Electrical Engineering
   Role: member   Date: Mar 2011
   Title: Global Change Reactive Background Subtraction

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

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

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

5. Mao Ye   Degree: Ph.D., Computer Science
   Role: member   Date: Dec 2014
   Title: 3D Reconstruction and Motion Analysis of Deformable Objects with Consumer Depth Cameras

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

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

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

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

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

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

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

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

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

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 — Degree: M.S., Computer Science
    Role: member — Date: Aug 2023
    Title: Adversarial Attacks on AI Systems in Medical Applications

57. Chang Ti — Degree: M.S., Computer Science
    Role: member — Date: Dec 2023
    Title: Handwritten Digit Recognition Web Plugin

58. Emma McMillian — Degree: M.S., Computer Science
    Role: member — Date: Dec 2023
    Title: Convolutional Neural Networks for Hyperspectral Image-to-Image Microscopy Translation

59. Fiona Xu — Degree: M.S., Computer Science
    Role: member — Date: Dec 2023
    Title: Adversarial Attack on Graph Embeddings from Text Dataset

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 Degree: M.S., Computer Science
    Role: member Date: Apr 2024
    Title: Exploring the Reasoning Abilities of Large Language Models

75. Joshua Tang Degree: M.S., Computer Science
    Role: member Date: Apr 2024
    Title: Autonomous Vehicle Object Classification with Uncertainty

76. Patrick Lynch Degree: M.S., Computer Science
    Role: member Date: Apr 2024
    Title: An Automated System for Detecting Errors in Oatmeal-Making Research Task

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