

NSF BIOGRAPHICAL SKETCH

NAME: Jacobs, Nathan

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POSITION TITLE & INSTITUTION: Director of Graduate Studies (Data Science), University of Kentucky

(a) PROFESSIONAL PREPARATION

INSTITUTION	LOCATION	MAJOR / AREA OF STUDY	DEGREE (if applicable)	YEAR YYYY
Washington University in Saint Louis	Saint Louis, MO	Computer Science	PhD	2010
University of Missouri Columbia	Columbia, MO	Computer Science	BS	2000

(b) APPOINTMENTS

- 2020 - present Director of Graduate Studies (Data Science), University of Kentucky , Computer Science, Lexington, KY
- 2016 - present Associate Professor, University of Kentucky, Computer science, Lexington, KY
- 2019 - 2020 co-Department Chair (interim), University of Kentucky, Computer Science, Lexington, KY
- 2017 - 2018 Visiting Research Scientist, Orbital Insight, inc, Mountain View, CA
- 2010 - 2016 Assistant Professor, University of Kentucky, Computer Science, Lexington, Kentucky

(c) PRODUCTS

Products Most Closely Related to the Proposed Project

1. Zhu J, Nolte A, Jacobs N, Ye M. Using machine learning to identify karst sinkholes from LiDAR-derived topographic depressions in the Bluegrass Region of Kentucky. *Journal of Hydrology*. 2020; DOI: 10.1016/j.jhydrol.2020.125049
2. Su Y, Zhang Y, Liang G, ZuHone J, Barnes D, Jacobs N, Ntampaka M, Forman W, Nulsen P, Kraft R, Jones C. A deep learning view of the census of galaxy clusters in IllustrisTNG. *Monthly Notices of the Royal Astronomical Society*. 2020; DOI: 10.1093/mnras/staa2690
3. Workman S, Jacobs N. Dynamic Traffic Modeling From Overhead Imagery. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*; 2020. DOI: 10.1109/CVPR42600.2020.01233
4. Maretto R, Fonseca L, Jacobs N, Korting T, Bendini H, Parente L. Spatio-Temporal Deep Learning Approach to Map Deforestation in Amazon Rainforest. *IEEE Geoscience and Remote Sensing Letters*. 2020; DOI: 10.1109/LGRS.2020.2986407
5. Hadzic A, Blanton H, Song W, Chen M, Workman S, Jacobs N. RasterNet: Modeling Free-Flow Speed using LiDAR and Overhead Imagery. *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*; 2020. DOI: 10.1109/CVPRW50498.2020.00112

Other Significant Products, Whether or Not Related to the Proposed Project

1. Hamraz H, Jacobs N, Contreras M, Clark C. Deep learning for conifer/deciduous classification of airborne LiDAR 3D point clouds representing individual trees. *ISPRS Journal of Photogrammetry*

- and Remote Sensing. 2019; DOI: 10.1016/j.isprsjprs.2019.10.011
2. Liang G, Wang X, Zhang Y, Xing X, Blanton H, Salem T, Jacobs N. Joint 2D-3D Breast Cancer Classification. 2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM); 2019. DOI: 10.1109/BIBM47256.2019.8983048
 3. Sajid H, Cheung S, Jacobs N. Motion and appearance based background subtraction for freely moving cameras. Signal Processing: Image Communication. 2019; DOI: 10.1016/j.image.2019.03.003
 4. Schulter S, Zhai M, Jacobs N, Chandraker M. Learning to Look around Objects for Top-View Representations of Outdoor Scenes. European Conference on Computer Vision; 2018. DOI: 10.1007/978-3-030-01267-0_48
 5. Song W, Workman S, Hadzic A, Zhang X, Green E, Chen M, Souleyrette R, Jacobs N. FARSA: Fully Automated Roadway Safety Assessment. IEEE Winter Conference on Applications of Computer Vision (WACV); 2018. DOI: 10.1109/WACV.2018.00063

(d) SYNERGISTIC ACTIVITIES

1. Active collaborations on the use of deep learning and machine learning in various application domains, including radiology, astrophysics, mechanical engineering, robotics, civil engineering, forestry, and hydrology.
2. Extensive service as a reviewer for journals and conferences, including serving as an Area Chair for IEEE Conference on Computer Vision and Pattern Recognition (CVPR) [2018, 2019, 2021] and Guest Editor for a 2019 Special Issue on Remote Sensing in Computer Vision and Image Understanding (CVIU, Elsevier). Recognized as Outstanding Reviewer for ICCV 2019 and CVPR 2017.
3. Supervising 22 students (including high school, undergraduate, MS, and PhD) and one postdoc over the past two years as director of the Multimodal Vision Research Laboratory (<http://mvrl.cs.uky.edu/>).
4. Two recently awarded patents on applications of machine learning to urban area understanding and position estimation for manufacturing: (1) N. Jacobs and S. Workman, Network architecture for generating a labeled overhead image, US Patent App. 16/045,606, Jan. 2020 and (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, US Patent App. 14/790,823, Jan. 2016.
5. Organizer or Co-Organizer for Doctoral Consortia at CVPR 2017, WACV 2018, and CVPR 2019. These events pair computer vision Ph.D. students, from around the world, with senior researchers for a facilitated mentoring luncheon.