Zachary Bessinger

🌐 *www.zachbessinger.com*

Education

2014–2018	**Ph.D., Computer Science**, *University of Kentucky*, Lexington, KY
	Researched and developed novel computer vision algorithms using multimodal deep learning models to understand the relationship between human appearance, scene, and geographic location.
	Dissertation: "Modeling and Mapping Location-Dependent Human Appearance."
2012–2013	**M.S., Computer Science**, *Western Kentucky University*, Bowling Green, KY, GPA: 4.0/4.0
	Thesis: "An Automatic Framework for Embryonic Localization Using Edges in a Scale Space"
2007–2011	**B.S., Computer Science**, *Western Kentucky University*, Bowling Green, KY, major GPA: 3.8/4.0
	Minor in Mathematics

Experience

Feb. 2022 – Present — **Senior Applied Scientist, Computer Vision**, *Zillow Group*, Seattle, WA
- Leading multimodal, computer vision focused projects efforts that power search, personalization, and valuation.
- Mentoring interns whose outcomes included publications in top computer vision venues.
- Lead projects in the Rich Media Experiences (RMX) team to derive features from imagery for downstream use across various teams and collaborators.

Jan. 2019 – Feb. 2022 — **Applied Scientist**, *Zillow Group*, Seattle, WA
- Developed and shipped several computer vision models that learn to identify important features from imagery for more accurately pricing homes with Zillow Offers (ZO).
- End-to-end researched and engineered a novel automated valuation machine (AVM) for ZO.
- Contributed code and research to improve Zillow's most notable AVM, the Zestimate.

Oct. 2017 – Feb. 2018 — **Data Scientist Intern**, *Zillow Group*, Seattle, WA
- Developed convolutional neural network (CNN) models that use images to improve the Zestimate.

Jun. 2014 – Dec. 2018 — **Teaching/Research Assistant**, *University of Kentucky*, Lexington, KY
- Advisor: Dr. Nathan Jacobs.
- TA for CS221, "First Course in Computer Science for Engineers." MATLAB programming.

Jul. 2013 – Jun. 2014 — **Software Developer**, *Publishers Printing Co.*, Shepherdsville, KY
- Developed/maintained Java-based software, PICA – Publishers Information and Costing Analyzer
- Enhanced Book Mapping module using Spring with Hibernate persistence for AS/400 and MS SQL
- Performance optimizations for Swing components and miscellaneous additions across all modules
- Improved synchronization efficiency when updating jobs, particularly in the Book Mapping module

Jun. 2011 – May 2013 — **Undergraduate/Graduate Teaching/Research Assistant**, *Western Kentucky University*, Bowling Green, KY
- NSF IIS: "Automatic Framework for Processing Drosophila Embryonic Images", PI: Dr. Qi Li
- Designed and implemented algorithms for automatically extracting embryonic contours
- Taught labs and graded assignments for Computer Science I & II (CS 180 & 181)

Publications

[1] Y. Zhuo, **Z. Bessinger**, L. Wang, N. Khosravan, B. Li, and S. B. Kang. TFM^2: Training-free mask matching for open-vocabulary semantic segmentation. In *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2025.

[2] T. Jing, L. Wang, N. Khosravan, Z. Wan, **Z. Bessinger**, Z. Ding, and S. B. Kang. iBARLE: imBalance-Aware Room Layout Estimation. In *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2024.

[3] T. Deb, L. Wang, **Z. Bessinger**, N. Khosravan, E. Penner, and S. B. Kang. ZInD-Tell: Towards

Translating Indoor Panoramas into Descriptions. In *IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW), Multimodal Learning and Applications Workshop (MULA)*, 2024.

[4] Z. Min, N. Khosravan, **Z. Bessinger**, M. Narayana, S. B. Kang, E. Dunn, and I. Boyadzhiev. LASER: LAtent SpacE Rendering for 2D Visual Localization. In *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022.

[5] 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 (JACR)*, 2020.

[6] **Z. Bessinger** and N. Jacobs. A Generative Model of Worldwide Facial Appearance. In *IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2019.

[7] 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)*, 2017.

[8] **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, 2016.

[9] **Z. Bessinger** and N. Jacobs. Quantifying Curb Appeal. In *IEEE International Conference on Image Processing (ICIP)*. IEEE, 2016.

[10] R. 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)*. IEEE, 2016.

[11] **Z. Bessinger**, G. Xing, and Q. Li. Localization of Drosophila embryos using connected components in scale space. In *IEEE International Conference on Image Processing (ICIP)*, pages 497–500. IEEE, 2012.

[12] Q. Li and **Z. Bessinger**. Learning scale ranges for the extraction of regions of interest. In *IEEE International Conference on Image Processing (ICIP)*, pages 2581–2584. IEEE, 2012.

Technical Experience

Proficient With

Languages	Python, MATLAB, Java
Technologies	Numpy, Pandas, Scikit-learn, PyTorch, Tensorflow, Matplotlib, Apache Spark, Git

Have Experience With

Languages	Android, C, C++, Javascript
Technologies	Android Studio, Spring, Bootstrap, Visual Studio

Service

Reviewer	2021-2022 – IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
	2022 – European Conference on Computer Vision (ECCV)
	2021 – IEEE International Conference on Computer Vision (ICCV)
	2017 – ACM Transactions on Multimedia Computing Communications and Applications (TOMM)

Honors & Awards

Fellowships	2014–2016 – University of KY Teaching Assistantship

Awards   2017 – CVPR Student Volunteer

2013 – Ogden College Outstanding Graduate Student Award in Computer Science

2013 – Ogden College Outstanding Graduate Research Student Award (honorable mention)

Activities

2014–2015   **OpenLexington**, Lexington, KY
OpenLexington is a Code for America brigade whose goal is to provide data visualization/access to the public.

2012–2013   **Android Development Group**, *Western Kentucky University*, Bowling Green, KY
Coordinated a weekly meeting group that taught students the basics of Android software design.

2008–2013   **ACM Local Chapter**, *Western Kentucky University*, Bowling Green, KY
Gave presentations on how to improve programming skills and invited guest speakers from local companies to present.