Kimberly J. Wilber

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GitHub · LinkedIn · Scholar

Research engineer with an academic computer vision background.

"Invaluable contributions in up-leveling monocular depth *across multiple product surfaces at Google* ... with greatly improved generalization to outdoor scenes as well as latency and memory savings!"

— Google L6 research scientist, partner team

"As a direct result of Kimberly's work, the Mediapipe team was able to use monocular depth as an 'on-device plugin' for their flagship image generation task ... *First real-time on-device monocular depth solution open sourced* via MediaPipe"

— Google L5 research scientist

"Kimberly's deep expertise in developing embedding models has positioned her as a *trusted authority and go-to expert*, even beyond her own team"

— Google L6 peer

Skills and Expertise

AI research infrastructure for LLMs, computer vision, and machine learning
I write and manage end-to-end research infrastructure from fledgling experiments to Google-scale teamwide collaborations. My projects include writing hooks for LLM mechanistic interpretability, drafting HTML UI for crowdsourcing, training quantized on-device depth prediction CNNs for 3D scene understanding, deploying linear probes at inference-scale, and more. I do everything from idea to paper deadline to product launch.

Full-stack software engineer
I love projects that require skilled craftsmanship across the stack, from tight inner loops to high-level UX. I'm proficient in UNIX/C, the numerical Python stack (PyTorch, sklearn, matplotlib, numpy/scipy, huggingface transformers), OLAP (DuckDB/LanceDB, Parquet), web backend (Flask, FastAPI, NodeJS), frontend (HTML/Javascript/CSS, Vue, React), and DB (SQLite, Postgres). I have over 20 years of experience administering Debian/Ubuntu server clusters across various hosting environments (AWS EC2, GCP, and on-prem) using tools like Ansible and Docker.

Open-source
I'm a contributor to projects including Racket and Node.js. My GitHub profile has 196 followers. Repositories I created have 200 forks and 700 stars.

Professional Experience

2024 – Present **Krnel.ai, Technical co-founder, New York, NY**

- As a technical co-founder, I stand up our research infrastructure from scratch to support our first products. I also do everything in between: pitches, lead generation, and demoing to potential clients.
- Krnel uses mechanistic interpretability techniques to help companies manage the reputational and compliance risks of their AI models.

2013 – Present **Computer vision foundation, Volunteer publication assistant**

- The CVF Open Access Archive serves most CVPR, ICCV, and WACV papers to the computer vision community since 2013.
- I maintain the PDF processing pipeline used in conference proceedings construction.
- Our stack (Python, Ghostscript, qPDF) adds page numbers, an attribution banner, and proper PDF metadata with automatic checks for common quality problems (figures overlapping margins, etc).
- Thanks to the automation I built, we're able to process 2,700+ papers with a 3-day turnaround time and less than 5 manual corrections per conference.

2018 – 2024 **Google AI, Software Engineer, New York, NY**
- Implemented real-time, on-device monocular depth estimation models for Project Guideline, a tool that helps visually impaired runners exercise independently.
- Helped create SANPO, a 3D panoptic video dataset for the computer vision community. My role was to create large-scale data processing infrastructure and to shepherd the collection of 3D depth data.
- Created and refactored internal debug tools for *RankEmbed*, Google Web Search's first foray into LLM embeddings. My tools helped engineers demo the product to executives to build support.

2014 – 2018 **Cornell Tech, Research Assistant, New York, NY**
- Conducted computer vision research on perceptual similarity, crowdsourcing, and object recognition.
- Helped establish and maintain the new vision group's presence at Cornell.
- Served as TA for classes including four semesters of "CS5785 Modern Analytics."

2017 **Google Photos Team, Summer Intern, Mountain View, CA**
- Implemented and tested tools to make it easier for ML engineers to prototype UI interactions.
- These tools helped shape the feature roadmap for Google Photos Sharing Suggestions.

2016 **Adobe Research, Summer Intern, San Jose, CA**
- Curated BAM, one of the first large-scale collections of professional commercial artwork, intended for ML object classification and emotion understanding.
- Built a data loader system in Python and Redis to quickly analyze millions of images for ML training and inference workloads, speeding up training by 5×.

2014 **Dropbox Photos Team, Summer Intern, San Francisco, CA**
- Conducted product-focused computer vision research.
- Introduced our team to more efficient tools and technologies.
- Maintained a computer vision evaluation and experimentation pipeline for crowdsourced data collection of face images.

2013 **University of California, San Diego, Research Assistant, San Diego, CA**

2012 – 2013 **Securics, Inc., Software Engineer, Colorado Springs, CO**

2009 – 2013 **Vision and Security Technology (VAST) Laboratory at UCCS, Assistant Researcher, Colorado Springs, CO**

2011 **NSF REU Program, University of Colorado Colorado Springs, Summer Researcher, Colorado Springs, CO**

2009 – 2010 **Securics, Inc., NSF RAHSS High School Intern, Colorado Springs, CO**

Education

2014 – 2018 **Ph.D. in Computer Science, Cornell Tech**
Advised by Dr. Serge Belongie. Thesis topic: combining computer vision and crowdsourcing techniques. Supported by the National Science Foundation Graduate Research Fellowship (NSF GRFP)

2009 – 2013 **Bachelor of Innovation in Computer Science, University of Colorado Colorado Springs**
Supported by the Kane Family Foundation Scholarship

Conferences, Awards, Scholarships

2011 – Present **Student Volunteer at several conferences:**
CVPR (IEEE Conference on Computer Vision and Pattern Recognition) 2011, 2012, 2013, 2014, 2015
WACV (Winter conference on Applied Computer Vision) 2012, 2013, 2014

2013 – 2016 **National Science Foundation GRFP Awardee**, UCSD/Cornell

2010 – 2013 **Dean's List**, UCCS

2010 – 2013 **Kane Family Foundation Scholarship Recipient**, Full tuition and books, UCCS

2010 – 2013 **Braxton Scholarship Recipient**, UCCS

Selected Publications

Note that some work before 2018 is published under a previous name. See here for the unabridged list.

2024 *PolyMaX: General Dense Prediction with Mask Transformer*
Xuan Yang; Liangzhe Yuan; **Kimberly Wilber**; Astuti Sharma; Xiuye Gu; Siyuan Qiao; Stephanie Debats; Huisheng Wang; Hartwig Adam; Mikhail Sirotenko; Liang-Chieh Chen. *Winter Conference on Applications of Computer Vision (WACV 2024)*

2023 *SANPO: A Scene Understanding, Accessibility, Navigation, Pathfinding, Obstacle Avoidance Dataset*
Sagar M. Waghmare; **Kimberly Wilber**; Dave Hawkey; Xuan Yang; Matthew Wilson; Stephanie Debats; Cattalyya Nuengsigkapian; Astuti Sharma; Lars Pandikow; Huisheng Wang; Hartwig Adam; Mikhail Sirotenko. *ArXiv*

2019 *Understanding Image Quality and Trust in Peer-to-Peer Marketplaces*
Xiao Ma; Lina Mezghani; **Kimberly Wilber**; Hui Hong; Robinson Piramuthu; Mor Naaman; Serge Belongie. *Winter Conference on Applications of Computer Vision (WACV 2019)*

2017 *BAM! The Behance Artistic Media Dataset for Recognition Beyond Photography*
M. Wilber; Chen Fang; Hailin Jin; Aaron Hertzmann; John Collomosse; Serge Belongie. *International Conference on Computer Vision (ICCV 2017)*

2016 *Residual Networks Behave Like Ensembles of Relatively Shallow Networks*
Andreas Veit; **M. Wilber**; Serge Belongie. *Neural information processing systems (NIPS 2016)*

2016 *Can we still avoid automatic face detection?*
M. Wilber; Vitaly Shmatikov; Serge Belongie. *Winter Conference on Applications of Computer Vision (WACV 2016)*

2015 *Learning Concept Embeddings with Combined Human-Machine Expertise*
M. Wilber; Iljung Sam Kwak; Serge Belongie. *International Conference on Computer Vision (ICCV 2015)*

2014 *Cost-Effective HITs for Relative Similarity Comparisons*
M. Wilber; Iljung Sam Kwak; Serge Belongie. *AAAI Conference on Human Computation and Crowdsourcing (HCOMP 2014)*

2014 *Good Recognition is Non-Metric*
Walter J. Scheirer; **M. Wilber**; Michael Eckmann; Terry Boult. *E. Pattern Recognition 47 (8), 2014*

2013 **Best paper award:** *Animal Recognition in the Mojave Desert: Vision Tools for Field Biologists*
M. Wilber; Walter J. Scheirer; Phil Leitner; et. al.. *Workshop on Applications of Computer Vision (WACV 2013)*

2012 *PRIVV: Private Remote Iris Authentication with Vaulted Verification*
M. Wilber; Walter J. Scheirer; Terry Boult. *Conference on Computer Vision and Pattern Recognition Biometrics Workshop (CVPR 2012)*