Lichen Wang

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Summary

Senior Applied Scientist with 5+ years of industry experience at LinkedIn and Zillow and a Ph.D. focused on machine learning and computer vision. Research expertise spans multimodal foundation models, video and scene understanding, and 3D perception, complemented by experience translating research into large-scale production ML systems. Co-authored 50+ peer-reviewed publications with 10,000+ citations and 15+ U.S. patents.

Skills

- **Programming & Frameworks**: Python, PyTorch, TensorFlow, OpenCV, SQL, C++
- **Foundation Models & Multimodal Learning:** VLMs, Video LLMs, CLIP, foundation model fine-tuning, model and domain adaptation, multimodal representation learning, Mixture-of-Experts (MoE)
- **Computer Vision & 3D Perception:** Video understanding, temporal modeling, open-vocabulary recognition, object detection, semantic segmentation, 3D scene understanding, RGB-D fusion
- **Production ML & Evaluation:** Recommendation/ranking, large-scale dataset curation, human-in-the-loop annotation, knowledge distillation, model deployment & low-latency inference, offline/online and A/B testing

Experiences

LinkedIn | Senior Machine Learning Engineer, Notification AI | Sunnyvale, CA **Aug 2024 – Aug 2026**

- Developed and deployed a Video-LLM-based recommendation framework that extracts world-knowledge-aware embeddings from raw video frames via a cross-layer knowledge-fusion Mixture-of-Experts (MoE), bypassing text-summary bottlenecks; enabled scalable, low-latency ranking through a store-and-retrieve architecture and improved video click-through rate (CTR) by 2.7%.
- Developed an LLM-based user interest modeling framework using parameter-efficient supervised fine-tuning (LoRA) to learn structured, personalized interest representations from historical video transcripts, enabling semantic user profiling and improving offline preference prediction AUC by over 2%.
- Developed a Transformer-based multimodal user behavior model to capture evolving behavioral patterns from historical activities, augmenting handcrafted features with learned embeddings to improve notification effectiveness prediction and optimize delivery timing; increased daily active users (DAU) by 0.4%.
- Owned end-to-end model development and deployment, designing training strategies to improve robustness against sparse/noisy signals and distribution shift, while collaborating with product and engineering teams on offline evaluation, online experimentation, and production monitoring.

Zillow | Senior Applied Scientist / Applied Scientist, AI Media Insights | Seattle, WA **Jun 2021 – Aug 2024**

- Developed a multimodal representation learning framework integrating CLIP-based ViT, BERT, and 3D geometry features to generate modality-specific and fused embeddings at home and region levels (e.g., kitchen islands), enabling downstream similar-home search and ranking; contributing to a 4.5% increase in user dwell time.
- Led the development of CLIP-based open-vocabulary visual understanding models, redesigning and fine-tuning a Side Adapter Network (SAN) to generate dense pixel-level representations and mask-level object embeddings. Matched visual features with CLIP text embeddings for text-guided object segmentation, enabling fine-grained home search and filtering; increased saved-listing rate by 1.8%.
- Developed a human-in-the-loop data flywheel for 3D room layout estimation, integrating imbalance-aware model training, automated pre-annotation, human correction, and iterative retraining. Improved robustness to complex room geometries and occlusions while reducing manual annotation and verification time by 28%.
- Co-developed ZInD-Tell, a large-scale, spatially grounded multimodal dataset spanning 1,575 homes and 67,448 panoramic images. Generated 3,150 human-validated home descriptions using GPT-4 grounded in 3D geometry and room connectivity graphs; guided the development of ZInD-Agent, a zero-shot multimodal framework for language-based home retrieval and description generation.
- Mentored 4 research interns across open-vocabulary detection, 3D room layout estimation, and multimodal home understanding, providing technical guidance from research formulation and model development to experimentation and publication; co-authored peer-reviewed papers at top-tier CV and ML conference papers.

Samsung Research America | Research Intern, AI | Mountain View, CA **Jun 2020 – Sep 2020**

- Developed a lightweight RGB-D salient object detection framework that leverages complementary visual and depth information, achieving comparable performance to RGB-only models with 50% of the model capacity while improving robustness in visually ambiguous scenes.
- Applied teacher–student knowledge distillation to compress RGB-D saliency detection models, reducing 62% model weights with only 0.57% performance drop, enabling efficient inference on mobile and edge devices.

NEC Labs America | Research Intern, Data Science & System Security | Princeton, NJ **Jun 2019 – Dec 2019**

- Developed SentRL, a reinforcement learning-based NLP framework that trains an agent to navigate syntactic dependency graphs, identify aspect-specific sentiment paths, and selectively filter irrelevant contextual information, achieving 3.7% improvement in fine-grained sentiment classification over baseline methods.
- Proposed SEED, an inductive and unsupervised graph representation learning framework combining structure-aware random walks (WEAVE), subgraph autoencoders, and distribution-based embeddings; improved classification accuracy by up to 10% over competitive baselines.

Zebra Technologies | CV Algorithm Intern | Lincolnshire, IL **Jun 2017 – Aug 2017; Jun 2018 – Aug 2018**

- Developed an embedded RGB and 3D point-cloud perception system for robust container classification, localization, and dimension estimation under noisy sensing; provided on-device guidance for sensor alignment and imaging quality, reducing equipment installation time by 48% and reliance on specialized technicians.
- Built and deployed a warehouse worker-safety monitoring system from the ground up, integrating data collection, YOLO-based human/face detection, pose estimation, and optimization for low-light and occlusions.

Selected Publications

Papers

- Haichao Zhang*, Yao Lu*, **Lichen Wang***, Yunzhe Li, Daiwei Chen, Yunpeng Xu, Yun Fu, "LinkedOut: Linking World Knowledge Representation Out of Video LLM for Next-Generation Video Recommendation," *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2026*.
- Yaoxin Zhuo, Zachary Bessinger, **Lichen Wang**, Naji Khosravan, Baoxin Li, Sing Bing Kang, "TFM2: Training-Free Mask Matching for Open-Vocabulary Semantic Segmentations," *IEEE Winter Conference on Applications of Computer Vision (WACV), 2025*.
- Tonmoay Deb, **Lichen Wang**, Zachary Bessinger, Naji Khosravan, Eric Penner, Sing Bing Kang, "ZInD-Tell: Towards Translating Indoor Panoramas into Descriptions," *IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshop, 2024*.
- **Lichen Wang**, Bo Zong, Yunyu Liu, Can Qin, Wei Cheng, Wenchao Yu, Xuchao Zhang, Haifeng Chen, Yun Fu, "Aspect-based Sentiment Classification via Reinforcement Learning," *IEEE International Conference on Data Mining (ICDM), 2021*.
- **Lichen Wang**, Bin Sun, Joseph Robinson, Taotao Jing, Yun Fu, "EV-Action: Electromyography-Vision Multi-Modal Action Dataset," *IEEE International Conference on Automatic Face and Gesture Recognition (FG), 2020*.
- **Lichen Wang**, Zhengming Ding, Zhiqiang Tao, Yunyu Liu, Yun Fu, "Generative Multi-View Human Action Recognition," *International Conference on Computer Vision (ICCV) (Oral), 2019*.

Patents

- **Lichen Wang**, Tonmoay Deb, Naji Khosravan, Joven Matias, "Automated Tool for Generating and Presenting Concise Visualizations of Dwelling Images," *U.S. Invention Patent*
- Eric Penner, Zachary Harrison, Min Hung Shih, Piali Syam, Zachary Scott Bessinger, **Lichen Wang**, Anish Khazane, Saeid Balaneshin, Ashwani Kapoor, Naji Khosravan, "Multimodal Similarity Based Property Listing Presentment System," *U.S. Patent Application Publication*
- Bo Zong, Haifeng Chen, **Lichen Wang**, "Reinforced Text Representation Learning," *Granted U.S. Invention Patent*

Education

Northeastern University, USA - Ph.D., Electrical & Computer Engineering **2016–2021**
Xi'an Jiaotong University, China - M.S., Electronic & Information Engineering **2013–2016**
Harbin Institute of Technology, China - B.Eng., Electrical Engineering **2009–2013**