Andrei Kopanev

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SUMMARY

Undergraduate researcher in Computer Science and Engineering at The Ohio State University with experience spanning multimodal learning, web agents, and autonomous systems. Contributed to large-scale dataset creation (BioCLIP-v2, 220M images) and benchmark design (Mind2Web-2, NeurIPS 2025), alongside work on modular pipelines for autonomous perception (AutoDrive Challenge) and GPS-denied localization (XNAV). Research interests center on making language models reliable collaborators: enabling persistent memory and context, reducing hallucinations through self-verification and trajectory revision, and designing human-AI workflows that are interruptible, steerable, and accountable.

EDUCATION

B.S. in Computer Science and Engineering Sep 2022–May 2026
The Ohio State University | GPA: 3.936

RESEARCH INTERESTS

- Reliable LLM collaborators that integrate seamlessly into human workflows.
- Memory and persistent context as enablers for adaptive, interactive assistants.
- Trustworthy reasoning - reducing hallucinations, enabling self-verification, and revising reasoning trajectories.
- Human-AI collaboration design - making models interruptible, steerable, and accountable.
- Bridging natural language reasoning with structured artifacts (notes, tasks, architectures) for reproducibility.

PUBLICATIONS

- Jianyang Gu, Samuel Stevens, Elizabeth G Campolongo, Matthew J Thompson, Net Zhang, Jiaman Wu, Andrei Kopanev, Zheda Mai, Alexander E. White, James Balhoff, Wasila Dahdul, Daniel Rubenstein, Hilmar Lapp, Tanya Berger-Wolf, Wei-Lun Chao, Yu Su. *BioCLIP 2: Emergent Properties from Scaling Hierarchical Contrastive Learning* . NeurIPS 2025 (Spotlight), 2025.
- Boyu Gou, Zanming Huang, Yuting Ning, Yu Gu, Michael Lin, Weijian Qi, Andrei Kopanev, Botao Yu, Bernal Jiménez Gutiérrez, Yiheng Shu, Chan Hee Song, Jiaman Wu, Shijie Chen, Hanane Nour Moussa, Tianshu Zhang, Jian Xie, Yifei Li, Tianci Xue, Zeyi Liao, Kai Zhang, Boyuan Zheng, Zhaowei Cai, Viktor Rozgic, Morteza Ziyadi, Huan Sun, Yu Su. *Mind2Web 2: Evaluating Agentic Search with Agent-as-a-Judge* . NeurIPS 2025 (Poster, Datasets and Benchmarks Track), 2025.

RESEARCH EXPERIENCE

Undergraduate Research Assistant Mar 2025–present

NLP Lab (Yu Su and Huan Sun), OSU
Columbus, OH, USA

- Contributed to the Mind2Web-2 benchmark (accepted at NeurIPS 2025, Datasets and Benchmarks Track), a large-scale evaluation suite for long-horizon web agents with human-authored tasks involving search, navigation, and real-world interactions.
- Authored around 15 percent of the benchmark tasks and supported large-model evaluation by running Google Deep Research and OpenAI Deep Research systems.
- Implemented large-scale caching of visited web pages, including manual resolution of CAPTCHA checks, ensuring reproducibility of experiments.

Research Lead / Tech Lead Jan 2024–present
XNAV (student-led project)
Columbus, OH, USA

- Co-authored a conference paper on map-matching for GPS-denied navigation, extending an existing algorithm with lane-change detection and benchmarking against IMU- and SLAM-based approaches.
- Designed and prototyped a modular perception pipeline (later refined for AutoDrive), integrating lane-detection models (CLRKDNet) with navigation logic.
- Researched, evaluated, and deployed SLAM models for comparison, ultimately selecting OpenVSLAM for experimental use.
- Contributed multiple sections to the paper and supported collaborative writing and editing.

Undergraduate Research Assistant Oct 2023–May 2025
Imageomics Institute, OSU
Columbus, OH, USA

- Developed open-source tools for large-scale image collection and dataset management, enabling the creation of the BioCLIP-v2 dataset (expanded from 10M to 220M images).
- Designed and implemented a distributed image downloader and supporting preprocessing scripts, handling fault tolerance, parallelization, and efficient storage.
- Tools were released as open-source repositories and adopted by the lab to support large-scale multimodal learning research.

Perception Subteam Lead → Perception/Pipeline Lead Aug 2023–present
Buckeye AutoDrive Challenge
Columbus, OH, USA

- The SAE AutoDrive Challenge II is a GM-sponsored international competition where universities transform a Chevrolet Bolt into a Level-4 autonomous vehicle.
- Implemented and deployed a 3D multi-object tracking model (MOT-3D) for autonomous vehicle perception, adapting it to handle static objects and manage detection flicker.
- Re-implemented the ROS 2 perception pipeline from scratch, improving reliability and modularity.
- Optimized inter-node image transfer, reducing latency from 15ms to 3ms while eliminating CPU bottlenecks.
- Currently leading migration to a Docker-based perception and control pipeline, coordinating integration with other subsystems.
- Mentored new perception members, developed project roadmaps, and led collaboration within a 50+ member multidisciplinary team.

PROJECTS

StepSafe (student-led project) Jan 2024–present
Tech Lead
Columbus, OH, USA

- Designed and led development of a V2X-inspired safety platform for real-time hazard detection and risk-aware navigation.
- Architected and implemented the backend (AWS/Kafka/PostGIS/TimescaleDB) and guided frontend/UI design, coordinating contributions across multiple teams.
- Developed system for hazard detection and risk profiling of roads and intersections, leveraging spatiotemporal data (S2 cells, historical hazard statistics).
- Defined product vision and technical roadmap, bridging user needs with scalable engineering solutions.

Student Online Store (class project, Russia) Mar 2023–Jun 2023
Full-stack Developer
Russia

- Designed UI/UX in Figma and implemented the full React.js frontend for an online game shop project.
- Collaborated with peer developer handling backend and desktop components.

TopSkills (student-led project, Russia) Dec 2020–Apr 2021
Frontend Developer
Russia

- Contributed to development of an educational web platform backed by a local university.
- Implemented interactive lesson pages and built a custom text editor for content creation.

TEACHING

Undergraduate Teaching Assistant | OSU - Intro to C++ Aug 2023–Dec 2023

- Graded assignments and labs, and held office hours to support student learning.
- Helped students debug code and understand core programming concepts; received positive feedback from attendees.

SERVICE & OPEN SOURCE

Reviewer | MTI Workshop on Multi-Turn Interactions in LLMs @ NeurIPS 2025

- Reviewed three submissions focused on large language model memory and multi-turn interaction.

Imageomics/distributed-downloader | Link | Role: Primary Author

- Designed and implemented a distributed image downloader for large-scale dataset creation (220M+ images for BioCLIP-v2).
- Features include parallelization, retry strategies, and fault tolerance for robust high-volume data collection.

Imageomics/TreeOfLife-toolbox | Link | Role: Primary Author

- Developed a toolkit for managing and processing large biological datasets.
- Supported workflows for phylogenetic analysis within the Imageomics Institute.