

# Kento Nishi

SAN JOSE, CA / CAMBRIDGE, MA

✉ kentonishi@college.harvard.edu | ⚡ GitHub | LinkedIn | Google Scholar | Garmin

## EDUCATION

**Harvard University** — Bachelor's & Master's in Computer Science

Aug. 2022 – Present

- Concurrent four-year AB/SM Program, w/ Honors. GPA: 3.971. Graduating May 2026.

## SKILLS

**Programming:** Python, TypeScript/JavaScript, C++, Java, Svelte, OpenGL, Bash, Git, Docker, L<sup>A</sup>T<sub>E</sub>X.

**Research:** PyTorch, CNNs, transformers, diffusion models, mechanistic interpretability, representation learning, explainability, multi-modal learning, data augmentation, LLMs, audio processing, GPU/CUDA.

**Misc.:** bilingual English/Japanese (professional-level), teaching, distance running, music composition.

## AFFILIATIONS

**Physics of AI (PAI) Group @ Harvard-NTT**, w/ H. Tanaka & E. S. Lubana. Mar. 2023 – Present

**Visual Computing Group (VCG) @ Harvard**, w/ H. Pfister. Aug. 2022 – Present

**Four Eyes Lab @ UC Santa Barbara**, w/ T. Höllerer. Jun. 2020 – Aug. 2022

## GRANTS

**Ezoe Memorial Recruit Foundation Scholarship** Apr. 2023 – Present

- \$95,000/year, covering tuition and living expenses. Support through BA, MS, and PhD.
- Oldest & most selective scholarship program in Japan (approx. 6 recipients/year).

## EMPLOYMENT

**Comcast** — Applied AI Labs, Speech AI Team.....

**Part-Time Contractor** (post-internship extension, remote) Sep. 2025 – Present  

- Continuing research to characterize biases of diffusion models powering Comcast's Speech AI systems.
- Aiming for a tier-1 conference paper submission and a proprietary patent filing.

**Grad-Level Summer Research Intern** (Washington DC, in-person) Jun. – Aug. 2025  

- Worked on production-scale speech models, serving over 50 million daily users on Xfinity & Sky TV.
- Engaged with engineers/managers/testers/lawyers to confront access/privacy/feasibility tradeoffs.

**Harvard SEAS** .....

**CS79 TA, Design of Useful and Usable Interactive Systems by K. Gajos** Aug. 2025 – Present  

- Sole undergraduate member of course staff; studio planning lead; studio leader.
- Teach tools like Figma; facilitate critical thinking about design goals, assumptions, and consequences.

## DISTINCTIONS

**Tier-1 Conference Reviewer:** ICLR 2026 (invitation-only).

2025

**John Harvard Scholar:** top 5% GPA in the Harvard College class of 2026.

2023, 2025

**Advanced Half-Marathoner:** 1h21m29s PR (Cambridge, Nov. 2025, 162nd/9,358). 6x finisher.

**Regeneron STS Top 300 Scholar:** the oldest, most prestigious high school STEM award. 2022

## RESEARCH THEMES

---

### Diffusion models, sequential tasks, control & alignment

- Developing a theory of train/test-time control parameter gaps in diffusion models (paper soon).
- Began in [MATS 2025](#) (ML Alignment & Theory Scholars Program); \$12K grant & \$10K for GPUs.
- Extended into mech-interp work at Comcast, debugging production Text-to-Speech diffusion models.
- Advised by [H. Tanaka \(PAI Group\)](#), [H. Pfister \(Harvard VCG\)](#), [K. Kumar & R. Tang \(Comcast\)](#).

### Transformers, representation learning, model mechanisms

- Explaining pre-training & in-context mechanisms w/ interpretable, controllable synthetic graph tasks.
- Published [first-author ICML 2025](#) paper; co-authored **2x ICLR** and **2x NeurIPS** papers.
- Funded by [PRISE 2024](#) (Harvard Prog. for Research in Science and Eng.); \$3K + housing & meals.
- Funded by [CBS-NTT Fellowship](#) (Physics of Intelligence Program); \$5K summer 2023 stipend.
- Advised by [H. Tanaka & E. S. Lubana \(PAI Group\)](#).

### Computer vision, semi-supervised learning, model robustness

- Designing compute-efficient ways to train accurate vision models under partial/noisy supervision.
- Published [first-author CVPR 2024](#) paper as a sophomore undergrad.
- At age 16, published [first-author CVPR 2021](#) paper & [first-author AAAI 2021](#) short paper.
- Won [Regeneron STS Top 300 Award](#) & gave invited talk at [Forum on Information Technology](#) in 2022.
- Advised by [H. Pfister \(Harvard VCG\)](#) since 2022; prev. [T. Höllerer \(UCSB Four Eyes Lab\)](#).

## TECHNICAL PROJECTS

---

### [LiveTL Apps](#)

- Founding dev of three modular addons that improve YouTube & Twitch ([LiveTL](#), [HyperChat](#), [YtcFilter](#)).
- 100K+ total users; 900+ repo stars; 20+ code contributors. Free, open-source, and cross-platform.

### [Torch Pitch Shift — PyPI](#)

- The first Python library for pitch-shifting on GPU at the time; later added to PyTorch upstream.
- 750K+ downloads/month; 135+ GitHub stars; used by [torch-audiomentations](#) (1.1K+ stars).

### [holoEN Christmas Advent Calendar](#)

- Full-stack dev of the event platform ([holoen-advent.com](#)); officially commissioned by [Cover Corp](#).
- 250K+ total users; a beloved yearly tradition in the [hololive English](#) community.

## OTHER ACTIVITIES

---

### [Harvard AI Safety Team \(AISST\), Research Compute Lead](#)

2023 – Present

- Mission: to reduce catastrophic risks from AI through research, education, and capacity-building.
- Managing student researchers' shared GPU resources via AWS.

### [2022 Forum on Information Technology \(FIT\)](#)

- Premier annual Japanese conference, convening research scientists and industry professionals.
- Invited speaker in the “Top Conference” track. Presented and answered questions entirely in Japanese.

### [San Francisco Japanese School](#)

2011 – 2019

- Attended full-day Saturday school for 9 years. Sponsored by the Japanese government.
- Maintaining bilingual, professional-grade proficiency in Japanese speaking, reading, and writing.

## ALL PUBLICATIONS

---

### Representation Shattering in Transformers: A Synthetic Study with Knowledge Editing

Kento Nishi, Rahul Ramesh, Maya Okawa, Mikail Khona, Hidenori Tanaka, Ekdeep Singh Lubana

**ICML 2025**, as **first author**. ~5 citations as of Nov. 2025.

- I built synthetic knowledge-graph tasks, implemented training and probing, and led the experiments.
- I revealed why overwriting knowledge in LLMs causes collateral damage to unrelated capabilities.

### In-Context Learning of Representations

Core Francisco Park, Andrew Lee, Ekdeep Singh Lubana, Yongyi Yang, Maya Okawa, Kento Nishi, Martin Wattenberg, Hidenori Tanaka

**ICLR 2025**, as co-author. ~30 citations as of Nov. 2025.

- I pinned down core experiment protocols and developed reusable code to training and visualization.
- My task designs helped explain how LLMs dynamically restructure entity representations in-context.

### Structured In-Context Task Representations

Core Francisco Park, Andrew Lee, Ekdeep Singh Lubana, Kento Nishi, Maya Okawa, Hidenori Tanaka

**NeurIPS 2024** NeurRep Workshop, as co-author.

- Precursor to ICLR 2025 “In-Context Learning of Representations.”

### Towards an Understanding of Stepwise Inference in Transformers:

#### A Synthetic Graph Navigation Model

Mikail Khona, Maya Okawa, Jan Hula, Rahul Ramesh, Kento Nishi, Robert Dick, Ekdeep Singh Lubana, Hidenori Tanaka

**ICML 2024**, as co-author. ~10 citations as of Nov. 2025.

- I implemented parts of the graph-navigation data generator, toy transformer, and training scripts.
- My code allowed us to identify how autoregressive transformers learn chain-of-thought reasoning.

### Stepwise Inference in Transformers: Exploring a Synthetic Graph Navigation Task

Mikail Khona, Maya Okawa, Rahul Ramesh, Kento Nishi, Robert P. Dick, Ekdeep Singh Lubana, Hidenori Tanaka

**NeurIPS 2023** R0-FoMo Workshop, as co-author.

- Precursor to ICML 2024 “Towards an Understanding of Stepwise Inference in Transformers.”

### Joint-Task Regularization for Partially Labeled Multi-Task Learning

Kento Nishi, Junsik Kim, Wanhua Li, Hanspeter Pfister

**CVPR 2024**, as **first author**. ~5 citations as of Nov. 2025.

- I proposed JTR, implemented the code, and led experiments, ablations, writing, and rebuttals.
- JTR is a simple, linear-complexity regularizer to train shared backbones with partially labeled data.

### Augmentation Strategies for Learning with Noisy Labels

Kento Nishi, Yi Ding, Alex Rich, Tobias Höllerer

**CVPR 2021**, as **first author**. ~175 citations as of Nov. 2025.

- I designed the decoupled augmentation strategy, wrote the code, and led the experiments.
- “Augmented Descent” improves learning by separating weak and strong augmentations in training.

### Improving Label Noise Robustness with Data Augmentation and Semi-Supervised Learning

Kento Nishi, Yi Ding, Alex Rich, Tobias Höllerer

**AAAI 2021** Student Abstract Track, as **first author**. ~5 citations as of Nov. 2025.

- Precursor to CVPR 2021 “Augmentation Strategies for Learning with Noisy Labels.”

## REFERENCES

---

Available upon request.