Nobline Yoo

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EDUCATION

Princeton University   SEPT 2024–MAY 2026
   M.S.E. in Computer Science   GPA: 4.0/4.0

Princeton University   SEPT 2019–MAY 2023
   B.S.E. in Computer Science   GPA: 3.948/4.0
   Certificates in Statistics & Machine Learning and Robotics

PUBLICATIONS & PREPRINTS

Nobline Yoo, Olga Russakovsky, Ye Zhu. "**D2D: Detector-to-Differentiable Critic for Improved Numeracy in Text-to-Image Generation.**" *Preprint, 2025*. [website] [paper]

Nobline Yoo, Olga Russakovsky. "**Efficient, Self-Supervised Human Pose Estimation with Inductive Prior Tuning.**" *Proceedings of the IEEE/CVF International Conference on Computer Vision (**ICCV**) Workshops, 2023* (ROAD++ Workshop). [code] [paper]
- Additionally presented at the Women in Computer Vision (WiCV) workshop.

Arjun Mani, **Nobline Yoo**, Will Hinthorn, Olga Russakovsky. "**Point and Ask: Incorporating Pointing into Visual Question Answering.**" Poster spotlight at *Visual Question Answering (VQA) workshop* at ***CVPR 2021***. [code] [paper]

RESEARCH PROJECTS

Improving numeracy in text-to-image models   SEPT 2024–Present
*Advised by Professor Olga Russakovsky, Professor Ye Zhu | **Princeton Visual AI Lab***
- Proposed novel way (D2D) to convert detectors into differentiable critics via new activation functions, allowing text-to-image models to leverage more robust count reasoning.
- Repositioned numeracy correction as initial noise selection problem and introduced a test-time, tunable Latent Modifier Network that corrects the initial noise using our D2D critic. Boosted accuracy by up to 13.7%, with minimal inference cost.

Self-supervised Human Pose Estimation   SEPT 2022–OCT 2023
Advised by *Professor Olga Russakovsky | **Princeton Visual AI Lab***
- Proposed a self-supervised model pipeline that outperforms the baseline using 3x less data, by employing inductive prior tuning, coarse-to-fine learning, and data augmentation.
- Identified the importance of inductive prior tuning to aligning pose estimation and reconstruction tasks, the central assumption behind self-supervision.

Digital Humanities Tools as Sites of Human-Computer Interaction   JAN 2022–MAY 2022

Advised by *Professor Brian Kernighan* | **Princeton Independent Work Seminar** | [[code](#)] [[paper](#)]

- Created analysis tool for dataset *Chronicling America*, using word vector analysis and topic modeling, and identified digital humanities tools as sites of human-computer interaction.
- **Awarded** the Independent Work Award by the Princeton Center for Statistics and Machine Learning and **featured** by the Princeton Center for Digital Humanities.

Incorporating Pointing into Visual Question Answering   FEB 2020–JUN 2021

Advised by *Professor Olga Russakovsky* | **Princeton Visual AI Lab**

- Created datasets to stress-test Visual Question Answering system on ambiguous questions and conducted analysis on the effectiveness of point supervision versus verbal disambiguation of objects in scene.
- Played with uncertainty in Visual Question Answering models to improve model robustness.

COURSE PROJECTS

Incorporating VLMs into Text-to-Image Correction Pipeline   SEPT–DEC 2024

Advanced Topics in Computer Science: Deep Dive into Large Language Models

- Explored incorporating VLMs GPT-4o and PaliGemma into image correction pipeline presented in Wu, Tsung-Han, et al. "Self-correcting LLM-controlled Diffusion Models."
- Achieved performance improvements across all benchmarks used for evaluation, with a jump of 6% on the LMD benchmark.

Perceptual Losses for Point-Based Neural Fields   APR–MAY 2023

Neural Rendering | [[code](#)] [[paper](#)]

- Explored MS-SSIM and Canny edge-based losses for novel view synthesis method proposed in Zhang, Qiang, et al. "Differentiable Point-Based Radiance Fields for Efficient View Synthesis."
- Showed a simple modification to Zhang et al. that yields a 4.68 increase in PSNR on a real-world scene from the LLFF dataset.

Prefix Tuning: Optimizing Large Language Models   JAN–MAY 2022

Natural Language Processing | [[code](#)] [[paper](#)] [[poster](#)]

- Reproduced paper from ACL | IJCNLP 2021 (Li, Xiang Lisa, and Percy Liang. "*Prefix-Tuning: Optimizing Continuous Prompts for Generation*") in a team of three.
- Conducted four additional ablation studies on prefix tuning for LLMs. Noticed a threshold prefix length (15 to 20) after which accuracy declines in a small dataset setting. Identified a prefix initialization that led to 2.6, 4.0, 0.17 point increase in METEOR, ROUGE-L, and CIDEr metrics from SOTA.

Drone: Navigating through Obstacles with Computer Vision   DEC 2022

Introduction to Robotics | [[video](#)]

- Programmed drone to navigate an obstacle course using computer vision for obstacle and destination recognition.

HONORS & AWARDS

- Sigma Xi Honor Society.
- Recipient of Peter and Rosalind Friedland Endowed Senior Thesis Fund 2022-23
- Election to **Tau Beta Pi** (top 1/5 of senior engineering class), 2022
- Independent Work Award, **Princeton Center for Statistics and Machine Learning** (awarded to 3 out of 124 students), 2022
- Election to **Tau Beta Pi** (top 1/8 of junior engineering class), 2021

TALKS

Student speaker at **CVPR Women in Computer Vision** workshop. *Perception, interaction and fairness: key components of visual recognition*. (Keynote speaker: Professor Olga Russakovsky; student speakers: **Nobline Yoo**, Angelina Wang and Sunnie S. Y. Kim). June 19, 2021.

TEACHING & OUTREACH

Graduate TA   SEPT 2024–Present
Princeton COS126 Computer Science: An Interdisciplinary Approach | *Fall24, Spring25, Fall25*
- Led twice-weekly classroom sessions for students (sizes between 13-21) & graded assignments.

Lead Research Instructor   JULY 2025, 2024, 2023, 2021, 2020 · JULY 2019–AUG 2019
Princeton AI4ALL | *3-week AI program for ~30 high-schoolers from underrepresented backgrounds*
- Lead Research Instructor in summer 2023-25; Research Instructor in previous summers.
- Led and set vision for instructional team on curriculum development with focus on hands-on learning, social impact, and ethical design in four core projects: (1-2) computer vision for accessibility and rainforest conservation, (3) natural language processing for mental health, (4) robotics for environmental monitoring.

Undergraduate Course TA   SEPT 2022–MAY 2023
Princeton Department of Computer Science | *Advanced Programming Techniques*
- Graded semester-long projects for Advanced Programming Techniques (COS333).

Individual and Group Tutor   OCT 2022–MAY 2023
Princeton McGraw Center for Teaching & Learning | *R Programming, POL345, SML201*
- Mentored students in R programming, quantitative social science, and data science in individual and group environments.
- Employed various teaching methods to tailor assistance to individuals to help solidify foundational knowledge and learn how to learn.

WORK EXPERIENCE

Engineer/Scientist   AUG 2023–2024
Johns Hopkins University Applied Physics Laboratory | *Asymmetric Operations Sector*
- Developed computer vision models for effective medical triage.

Software Development Engineer Intern   MAY 2022–AUG 2022
Amazon AWS in Seattle, Washington | *Supply Chain Organization*
- Built a configuration system to influence AWS' supply-demand matching.

Open Access Repository Student Assistant   SEPT 2019 – MAY 2023
Princeton University Library | *Scholarly Communications Office*
- Identified faculty-authored Open Access articles and updated Princeton's Open Access Repository.

OTHER PROJECTS

Computer Vision for Medical Triage in High-Noise Environments   NOV 2023–FEB 2024
DARPA Triage Challenge | **Johns Hopkins University Applied Physics Laboratory**
- Helping develop DARPA Triage Challenge.
- Developing computer vision models to detect hemorrhage and respiratory distress for effective medical triage in high-noise, diverse environments.

ACTIVITIES

Johns Hopkins APL Women in Technology   AUG 2023–2024
Princeton Women in Computer Science   SEPT 2019–MAY 2023
Princeton Society of Women Engineers (SWE)   SEPT 2020 – MAY 2023

SERVICE

COS G1 Mentorship Program   SEPT 2025–Present
Mentor

AI Lab Student/Research Un-Conference   FEB 2025
Volunteer Room Lead (provided assistance for Spotlight Research Talks)

Johns Hopkins APL ASPIRE Program   NOV 2023–JAN 2024
Mentor for high-school intern interested in STEM

Princeton SWE High School Engineering Colloquium   APR 2023
Volunteer Panelist
- Mentored high-school girls interested in STEM by answering questions about Princeton's Engineering experience and giving advice.

Princeton Kindred Spirit   NOV 19, 2022

Volunteer Videographer

- Recorded Kindred Spirit acapella's fall arch sing.

Princeton AI4ALL   JULY 2022

Volunteer

- Provided guidance to the natural language processing research instructor team on transitioning from in-person to remote instruction and strategies to engage students, rooted in my experience as research instructor in summers 2019-2021.

Princeton Nursery School   SEPT 2–6, 2019

Volunteer

- Assisted daycare for preschoolers between ages 2½ to 5.
- Helped repaint and decorate indoor spaces, clean outdoor playground.

SKILLS

- Languages: Python, Java, C, Javascript, HTML/CSS
- Frameworks/Packages: PyTorch, Tensorflow, Numpy
- Technologies: Unix, Git, Latex