Yunyan Duan

https://yyd27.github.io

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Work Experience

Technische Universität Darmstadt — Darmstadt, Hessen, Germany

Post-doctoral fellow & Research software engineer — *Jul. 2022 – present*

- Conducted visual perception research to better understand how humans process the visual input by integrating multiple visual cues, such as color, shape, texture, and motion information
- Managed and maintained psychophysics lab devices to ensure accurate display of visual stimuli; implemented code review practices to improve code quality and collaboration among lab members

Tencent — Shenzhen, Guangdong, China

Data Scientist — *Jul. 2021 – Jul. 2022*

- Extracted, transformed, and loaded data to calculate metrics online and offline using HiveSQL, supporting routinely and customized data analysis of a short-video platform
- Analyzing behavioral data and content data with statistical methods and machine learning models to generate in-depth insights about users' intentions and needs, providing suggestions for improving a recommendation system

Education

Northwestern University — Evanston, IL, United States

Ph.D., ***Linguistics*** — *2021*

- Dissertation: Word identification and eye movement control in reading as rational decision making
- Advisor: Dr. Klinton Bicknell
- Cognitive Science Specialization

Peking University — Beijing, China

Bachelor of Science, ***Statistics & Psychology*** *(Double major)* — *2013*

Research Interests

I am interested in human cognition, especially how humans actively acquire and combine information from various sources to build a comprehensive representation of the visual input efficiently. I use both psychological experimentation and computational modeling approaches, with a focus on eye-tracking data. Besides my primary interest in computational psycholinguistics, I also develop interests in machine learning, reinforcement learning, and computer vision as I apply these techniques in my research.

Conference Presentations (excluding those with proceedings)

1. **Duan, Y.**, Mahncke, S., & Wallis, T. Combining surface reflectance and motion cues in peripheral target detection. Poster presentation at the 24th Annual Vision Sciences Society Meeting, St. Pete Beach, Florida, 17-22 May 2024.
2. Eicke-Kanani, L., **Duan, Y.**, & Wallis, T. From visual features of moving objects to subjective impressions of causality. Poster presentation at the 24th Annual Vision Sciences Society Meeting, St. Pete Beach, Florida, 17-22 May 2024.
3. **Duan, Y.**, Berzak, Y., Bicknell, K., & Levy, R. Inferring sentence comprehension from eye movements in reading. Poster presentation at the 32nd annual CUNY Conference on Human Sentence Processing, University of Colorado, Boulder, Colorado, 29-31 March 2019.
4. **Duan, Y.**, & Bicknell, K. (2019). A rational model of word skipping in reading: ideal integration of visual and linguistic information. Poster presentation at the 32nd annual CUNY Conference on Human Sentence Processing, University of Colorado, Boulder, Colorado, 29-31 March 2019.
5. **Duan, Y.**, & Bicknell, K. (2016). Word identification in reading is constructive: Refixations seek new visual information. Poster presentation at the 22nd annual conference on Architecture and Mechanisms for Language Processing (AMLaP), Bilbao, Spain, 1-3 September 2016.
6. **Duan, Y.**, Yu, H., & Zhou, X. (2014). Avoiding eyes reveals guilty heart: An eye movement study on interpersonal guilt. Poster presentation at the 6th Chinese International Conference on Eye Movements (CICEM), Beijing, China, 5-9 May 2014.

Academic Journal Publications

1. Chang, W., **Duan, Y.**, Qian, J., Wu, F., Jiang, X., & Zhou, X. (2020). Gender interference in processing Chinese compound reflexive: Evidence from reading eye-tracking. *Language, Cognition and Neuroscience*. 1-16.
2. **Duan, Y.**, & Bicknell, K. (2019). A rational model of word skipping in reading: Ideal integration of visual and linguistic information. In *Proceedings of the 41th Annual Conference of the Cognitive Science Society*: 275-281. ***Winner of best Computational Modeling paper in Perception & Action.***
3. **Duan, Y.**, & Bicknell, K. (2017). Refixations gather new visual information rationally. In *Proceedings of the 39th Annual Conference of the Cognitive Science Society*: 301-306.
4. Yu, H., **Duan, Y.**, & Zhou, X. (2017). Guilt in the eyes: Eye movement and physiological evidence for guilt-induced social avoidance. *Journal of Experimental Social Psychology, 71*, 128-137.
5. ***Duan, Y.**, & *Wu, O. (2016). Learning with auxiliary less-noisy labels. *IEEE Transactions on Neural Networks and Learning System*, *28(7)*, 1716-1721. (* indicates equal contributions.)
6. Luo, Y., **Duan, Y.**, & Zhou, X. (2015). Processing rhythmic pattern during Chinese sentence reading: an eye movement study. *Frontiers in Psychology, 6*, 1881.
7. Wang, L., **Duan, Y.**, Theeuwes, J., & Zhou, X. (2014). Reward breaks through the inhibitory region around attentional focus. *Journal of Vision, 14(12):2*, 1-7.

Teaching

- **2022/2023 Winter:** Experimentalpsychologisches Praktikum | Practical course | B.Sc.
- **2023/2024 Summer:** Cognitive Science I: Wahrnehmen | Seminar | B.Sc.
- **2023/2024 Summer:** Psychology Lab for cognitive science | Practical course | B.Sc.

Skills

Programming language: Python (5+ years), R (5+ years), SQL (2+ years), MATLAB (1+ years), HTML/CSS/JavaScript (occasionally)
Data science: statistical inference, machine learning, causal inference, experimentation
Cognitive science: Eye-tracking, psycholinguistics, experiment design, psychophysics, computational cognitive models, decision making, scene perception
Natural language: Mandarin Chinese (native), English (proficient), German (beginner)

Online Learning

Coursera https://www.coursera.org/
Certificate: ***Reinforcement Learning*** *Specialization* *Mar. 2020*

Coursera https://www.coursera.org/
Certificate: ***Deep Learning*** *Specialization* *Nov. 2018*

Stanford Online https://lagunita.stanford.edu/
Statement of Accomplishment: ***Mining Massive Datasets*** *Jul. 2017*

Side Projects

personal Github page: https://yyd27.github.io
Individual contributor *Apr. 2017 –*

Architecture highlights in Shanghai Shanghai library open data challenge
Team lead *May – Aug. 2019*

- Led a team of seven people to develop a website featuring architectures of historical importance in Shanghai
- Developed back-end code (implemented in Python/Django) to categorize architectures based on text descriptions
- Managed weekly updates, participated in discussion of product design, and prepared final presentation

Word evolution in ancient Chinese poems Shanghai library open data challenge
Individual contributor *May – Aug. 2018*

- Developed a website aiming to help researchers gain insights into word evolution, style change, and social evolution reflected in ancient Chinese poems over hundreds of years
- Independently came up with the idea, designed features, developed applications, and wrote documentation
- Implemented website using Python/Django and visualized data patterns using R Shiny