# Hyemi Song

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# Summary

Hyemi Song is a researcher and designer interested in topics related to "data, communication, and humans" in complex systems. Her academic research areas include infovis, HCI, and Immersive Analytics. Currently, she studies Natural Language and Data Visualization Interplay in XR under the supervision of Dr. Amitabh Varshney.

# **Educational Background**

**University of Maryland**, College Park, USA, 2022-Present Ph.D. Computer Science

**University of Maryland**, College Park, USA, 2022-2024 Master of Science, Computer Science

**Rhode Island School of Design**, Providence, USA Master of Fine Arts, Digital + Media

**University of the Arts London**, London, UK Foundation, Visual Communication Design

**The Catholic University of Korea**, Seoul, Korea Bachelor of Science, Molecular Biology

# Research Experiences

**University of Maryland College Park**, USA, 2022 - Present **Position**: Research Assistant (Advisor: Dr. Amitabh Varshney)

Labs: UMD Graphics and Visual Informatics Laboratory, Human-Computer Interaction Lab

Currently working on Natural Language and Data Visualization Interplay in XR (within Generative Al-powered immersive analytics).

Massachusetts Institute of Technology, MIT Senseable City Lab, Cambridge, USA, 2016 - 2017

Position: Research Fellow, Data Visualization Specialist

Developed an award-winning project, Cityways, Driving DNA, Pisa Pool, Urban Exposure, and more.

NAVER Corporation, Seoul, Korea, 2011 - 2014

Position: UX Researcher

Designed mobile/web UX/UI for a Social Network Service, 'me2day' (Korea's equivalent of Twitter), and designed the Portal Service, 'NAVER' (the largest search engine in Korea).

### Teaching Experiences

University of Maryland College Park, 2022 Spring/Summer, 2023 Spring/Summer/Fall

Position: Teaching Assistant

Class: Introduction to Data Science, Web Application Development with JavaScript

Rhode Island School of Design, 2016 Winter

Position: Instructor

Class: Measuring the Universe (2016 RISD Winter Session)

# **Industry Experiences**

Microsoft, Redmond, USA, 2019 - 2022

Position: Senior Designer

Specialized in Data Visualization, Designed for Machine Learning and Al products. Designed Error Analysis Dashboard, Azure Machine Learning Studio, and more.

Datadog Inc, New York, USA, 2017 - 2019

Position: Product Designer

Specialized in Data Visualization. Designed/developed Service Map, Host, and Infra map.

eyeballNYC, New York, USA, 2015

Position: Design Intern

Designed a Logo for Sylvia Day who is a US best-selling author, as well as working on 5+ other projects.

VINYL Interactive, Seoul, Korea, 2010 - 2011

Position: UX/UI designer

Designed and developed the web/mobile Service Strategies & Proposals, interactive installations, and digital media promotions for 10+ clients; SAMSUNG, Korea

Telecommunication, and more. KT Olleh Square won a prize from the iF design awards.

2015 Brothers, Seoul, Korea, 2009 - 2010

Position: Art Director

Designed and directed advertising projects for 20+ clients, including SKTelecom,

SAMSUNG, and Korea Technology.

**PXD**, Seoul, Korea, 2008 - 2009 Position: Interaction Designer

Developed and designed mobile/web UI/UX services for clients including SKTelecom and SAMSUNG.

### Samsung Electronics, Seoul, Korea

Position: Design intern

Researched web 2.0 and worked on a Flexible Display Project proposal.

### Cheil World Wide, Seoul, Korea

Position: Design intern

Participated in a NY Time Square Outdoor Advertisement Proposal to make a creative movie.

#### Kiz Entertainment. Seoul. Korea

Position: Clay Animator

Participated in Clay animations for an advertisement, and TV Series with 5+ Clients, including Korean

Broadcasting System and Dino land.

# **Research Projects**

### Natural Language and Data Visualization Interplay in XR, 2023 - Present

Role: First Author

My research explores the complex interplay between natural language and data visualizations in XR environments for users with diverse background and expertise levels. This work is situated within the broader context of Generative AI-powered immersive analytics with multimodal interaction.

### Sensemaking with Heterogeneous data, 2023

Role: First Author

This study examines the impact of integrating text and visualization in data analysis tools on users' sensemaking processes. We conducted self-experiments with toy datasets on gun violence, comparing human and GPT-4 analyses, and carried out a formative study using semi-structured interviews.

# Towards understanding in-context learning with contrastive demonstrations and saliency maps, 2023, Link

Role: Co-Author

We investigate the role of various demonstration components in the in-context learning (ICL) performance of large language models (LLMs). Specifically, we explore the impacts of ground-truth labels, input distribution, and complementary explanations, particularly when these are altered or perturbed.

Beyond Replication: How Timing and Schematic Similarity Shape Example-Based Data Visualization Design, 2023, (Under Review)

Role: Co-Author

This research investigates the influence of examples on visualization design, identifying key factors in idea transfer and effectiveness and guiding future example-based design studies.

# Intents, Techniques, and Components: a Unified Analysis of Interaction Authoring Tasks in Data Visualization, 2022-2023

Role: First Author

This paper introduces a new framework for composing interactions in data visualization, consolidating existing models based on the analysis of 45 real-world examples.

### **Publications**

Zongxia Li, Paiheng Xu, Fuxiao Liu, **Hyemi Song**, Towards understanding in-context learning with contrastive demonstrations and saliency maps, arxiv.org/abs/2307.05052, 2023

**Hyemi Song**, Sai Gopinath, Zhicheng Liu, Intents, Techniques, and Components: a Unified Analysis of Interaction Authoring Tasks in Data Visualization, School Archive, University of Maryland, 2023

Hyemi Song, Walking in a place, Walkestra, MFA Thesis, Rhode Island School of Design, 2016

# **Books & Book Chapters**

**Hyemi Song**, Solar System, Annual Student Artists' Book Juried Contest, Rhode Island School of Design, 2015 Steven Heller, Rick Landers, Raw Data, (Published Works: The temperature of my mind, Visualizing works), 2014

# Invited talks (Selected)

**Ohio State University** Ohio, USA, 2022 Lecture: Data and Human Communication

GyeongGi Cultural Foundation, Seoul, Korea, 2021

Lecture: Data as a communication medium: art, design, and human

San Jose State University San Jose, USA, 2021

Lecture: Data and Human Communication

Workshop: Measuring the temperature of my mind

### Jury, Peer Review, Advising service

DIS- Reviewer, Full papers, 2024 - Present

IEEEVIS - Reviewer, Full papers (2023), Short papers (2024), 2023 - Present

PacificVis - Juror, 2022 - Present

IEEEVIS Arts Program - Program Committee / Link, 2018 - Present

A' Design Award & Competition, Italy - Jury Member, 2018 - 2022

Brown University, Computer Science Department, USA - Portfolio Reviewer, 2019 - 2021

Apexart, USA - Jury Member, 2017

# Grants, Fellowships & Scholarships

**DIS**, USA - Awarded a complimentary one-year ACM Professional Membership (for paper review contribution), 2024 **IEEEVIS**, USA - Inclusive and Diversity Scholarship, 2023

University of Maryland College Park, USA - Dean's Fellowship/Assistantship, 2022-Present

Massachusetts Institute of Technology, USA - Fellowship, 2016 - 2017

Rhode Island School of Design, USA - Assistantship/Fellowship, 2014 - 2016

Samsung Art & Design Institute, Korea - Scholarship, 2007

### **Awards**

IEEE Arts Program, Melbourne, Australia - Accepted for exhibition, 2023 (Project: Solar System)

A'Design Award and Competition, Italy - Winner (Gold), 2018-2019

Information is Beautiful Awards, USA - Long List, 2018

World Changing Ideas Awards (by Fast Company), USA - Finalist, 2018

IEEE Arts Program, Berlin, Germany - Accepted for exhibition

A'Design Award and Competition, Italy - Winner (Iron), 2016-2017

53rd American Graphic Design Awards, GDUSA, USA -Winner (Student), 2016

Spark International Design Awards, USA - Finalist, 2016

Annual Student Artists' Book Juried Contest, USA - Accepted for exhibition and publication at RISD Fleet Library, 2015

Adobe Design Achievement Awards, USA - Semifinalist, 2008, 2015, 2016

Adobe Design Achievement Awards, USA - Honorable Mention 2007

IF Design Award, USA - Winner, 2010

Good Design Award, Japan - Winner, 2010

Seoul Design Olympiad 2009, Korea - Winner (Honorable Mention)

SADI Graduation Award, Korea - Experimental Portfolio Winner

11th Environmental Management Corporation Award, Korea - Winner

#### **Press**

Monthly Design (Oldest Korean Design Magazine), Seoul, Korea, 2018

Feature Interview, Title - Data Visualization Designer, Hyemi Song / Link

Data Vis Today, USA, 2018

Feature Interview, Podcast (Episode 13) / Link

IdN, Hong Kong, 2018

Featured article (Project: CityWays), IdN is an international Design Magazine / Link

The Guardian, USA, 2016

News Article (Project: Urban Exposure), Data Visualization at MIT Senseable City Lab / Link

Visual Loop, Brazil, 2012

Featured article, Title - Finding stories of data visualization from twitter / Link

Information Aesthetics, USA, 2011

Featured article, Title - Visualizing Works: Hyemi Song's Innovative Portfolio / Link

Visualising Data, USA, 2011

Featured article, Title - Visualizing Works: Hyemi Song's Innovative Portfolio

Sadi Vision, Korea, 2011

Featured article (Project: Visualizing Works)

IF Online Gallery, USA, 2010

IF Online Gallery (Project: KT Olleh Square) **2009 Seoul Design Olympiad**, Korea, 2009

Annual publication for winners

Adobe Design Achievement Award Online Gallery, USA, 2008

ADAA Online Gallery (Project: The temperature of my mind

## **Exhibitions**

IEEE Arts Program, Melbourne, Australia, 2023 (Project: Solar System)

Design Korea Festival 2020, Design Beyond Data, @Coex, Seoul, Korea, (Declined) 2020

IEEE Arts Program, Berlin, Germany, 2018

A'design Award Winner exhibition, @Mood, Italy, 2017

Shenzhen Design Week, @Shenzhen Convention Center, China, 2017

RISD Nature Lab anniversary exhibition, @Waterman Gallery, USA, 2017

Internet Festival, @Waterman Gallery, Pisa, Italy, 2016

RISD Graduate Exhibition, @Providence Convention Center, USA

Dark Matter, @RISD Sol Koffler Gallery, USA

Image Landscapes, @RISD Gelman Gallery, USA

Annual Student Artists' Book Exhibition, @RISD Fleet Library, USA

2009 Seoul Design Olympiad, @Jamsil Main Stadium, Korea

Sharing Experience 2009, @Zero one center Gallery, Korea

Onepiece Magazine Ceremony Party 500, Korea

Reviewing Hanul Exhibition, @Space Hiut, Korea

GUANGZHOU Design Korea Exhibition, Guangzhou, China

2nd D.I.P. Exhibition, @SADI Space Gallery, Korea

21st D.I.P. Exhibition, @SADI Space Gallery, Korea

SADI Graduation Exhibition, @SADI Space Gallery, Korea

Hanul Exhibition, @Shinhan Gallery, Korea

Chelsea College of Arts Graduation Exhibition, @Hugon Road Gallery, UK

# Coursework (UMD)

Explainable Natural Language Processing Link

Natural Language Processing Link

User Experience Research Methods Link

Information Visualization Link

Advances in XR Link

Info-Centric Design System Link

Interactive Technologies in Human-Computer Interaction

Visual Analytics

Bioinformatics (AU)

Embodied Media Design (AU)

### **Skillsets**

Front, Backend, Data Visualization, Data Science, AR/VR

Javascript, React, Redux, Express.js, MongoDB, Python, HTML, CSS, C#

D3js, Vegalit, Matplotlib, Three.js, PyTorch, Unity

### Design & Research

Graphic Design, UX/UI design, Interaction Design, UX Research, Academic Research