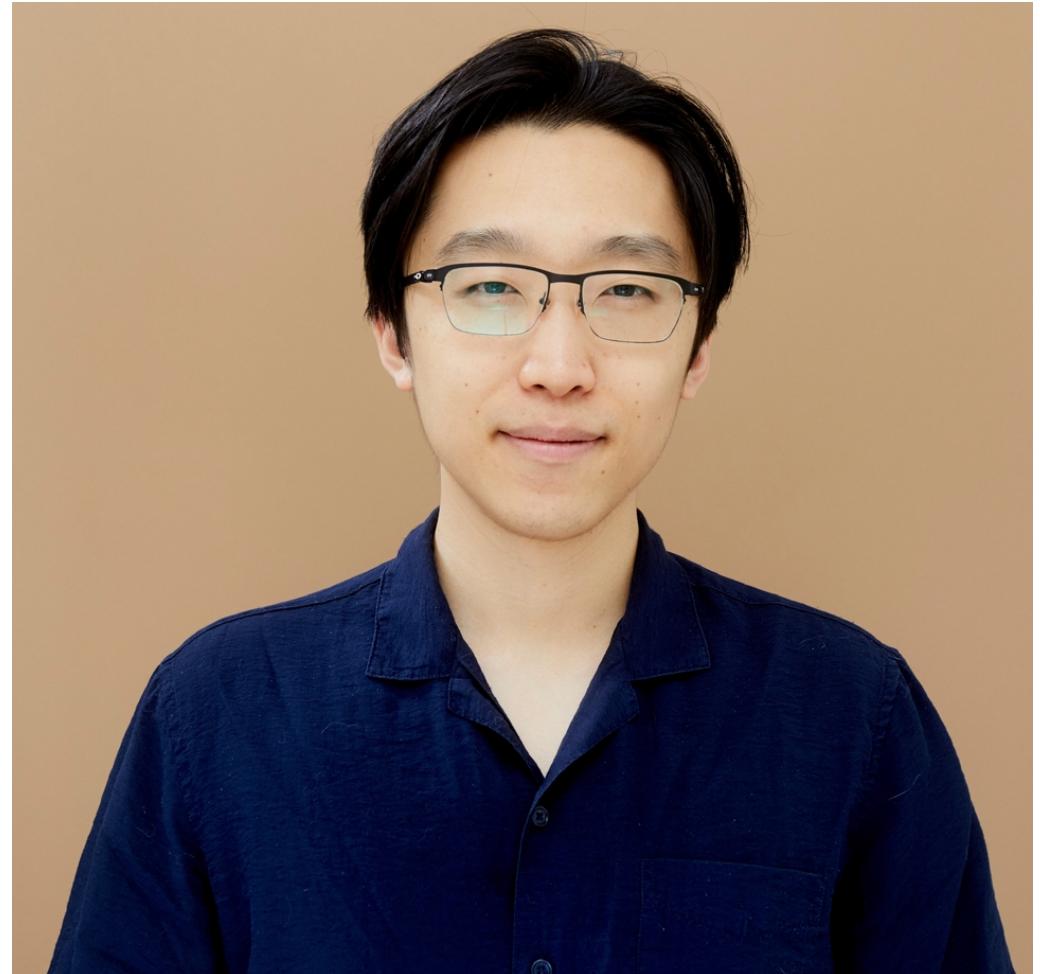


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SKILLS

Statistics

A/B Hypothesis Testing

Experimentation

Data Visualization

Regression

Classification

Artificial Neural Networks

Linear Mixed Models

Time-series Modelling

Clustering/Dimensionality Reduction

Natural Language Processing

Mouse-tracking

Virtual Reality

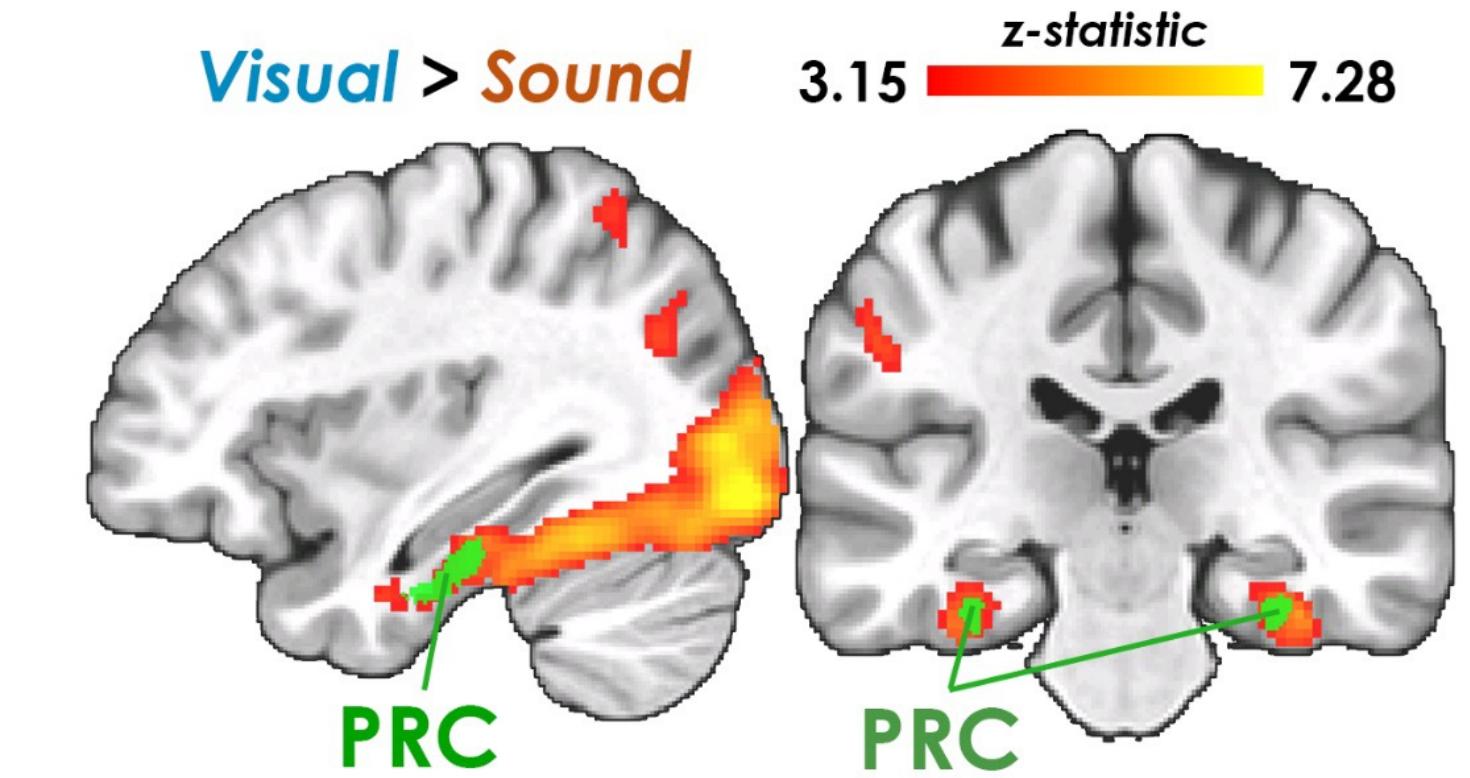
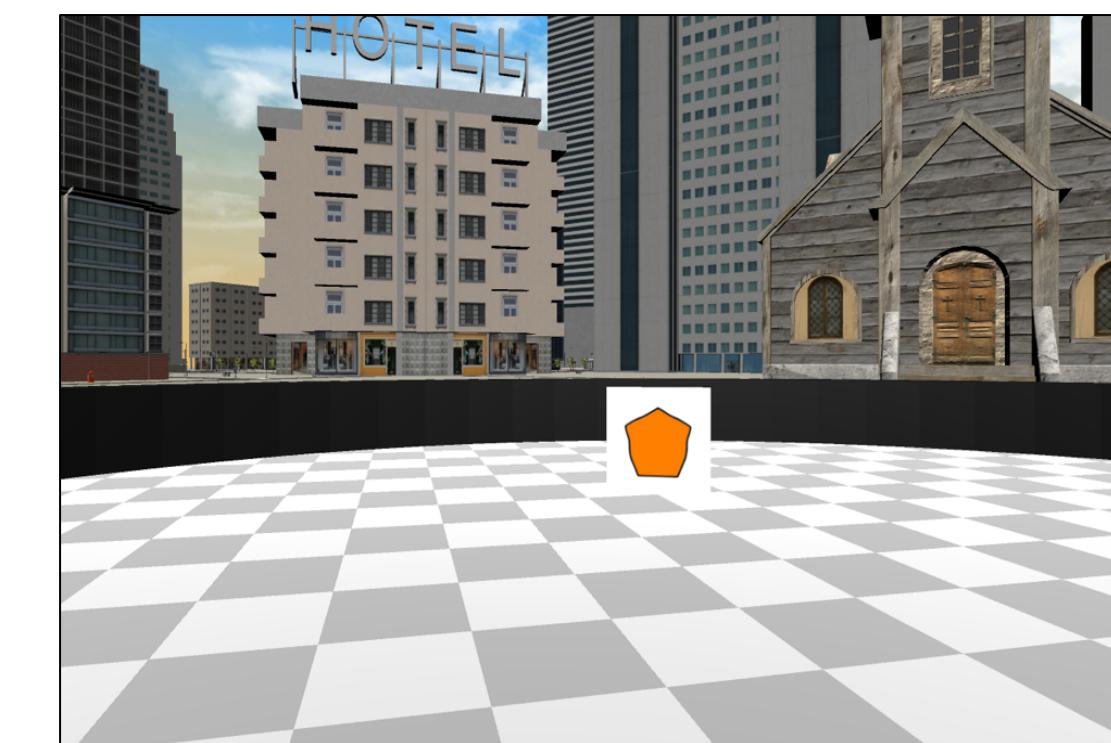
3D-Printing

Brief Overview

Hi! Thank you for taking the time to read through my portfolio. This portfolio contains the highlights of a few personal projects I have recently worked on, as well as a high-level overview of my research conducted during graduate school and as a postdoctoral fellow.

The aim is to show my interests and expertise in using a wide range of data analytics to tackle research-based and real-world problems. Furthermore, I aim to show that I can summarize almost a decade of research on the human mind succinctly via visualizations.

Each project description has a **link** to the full presentation.

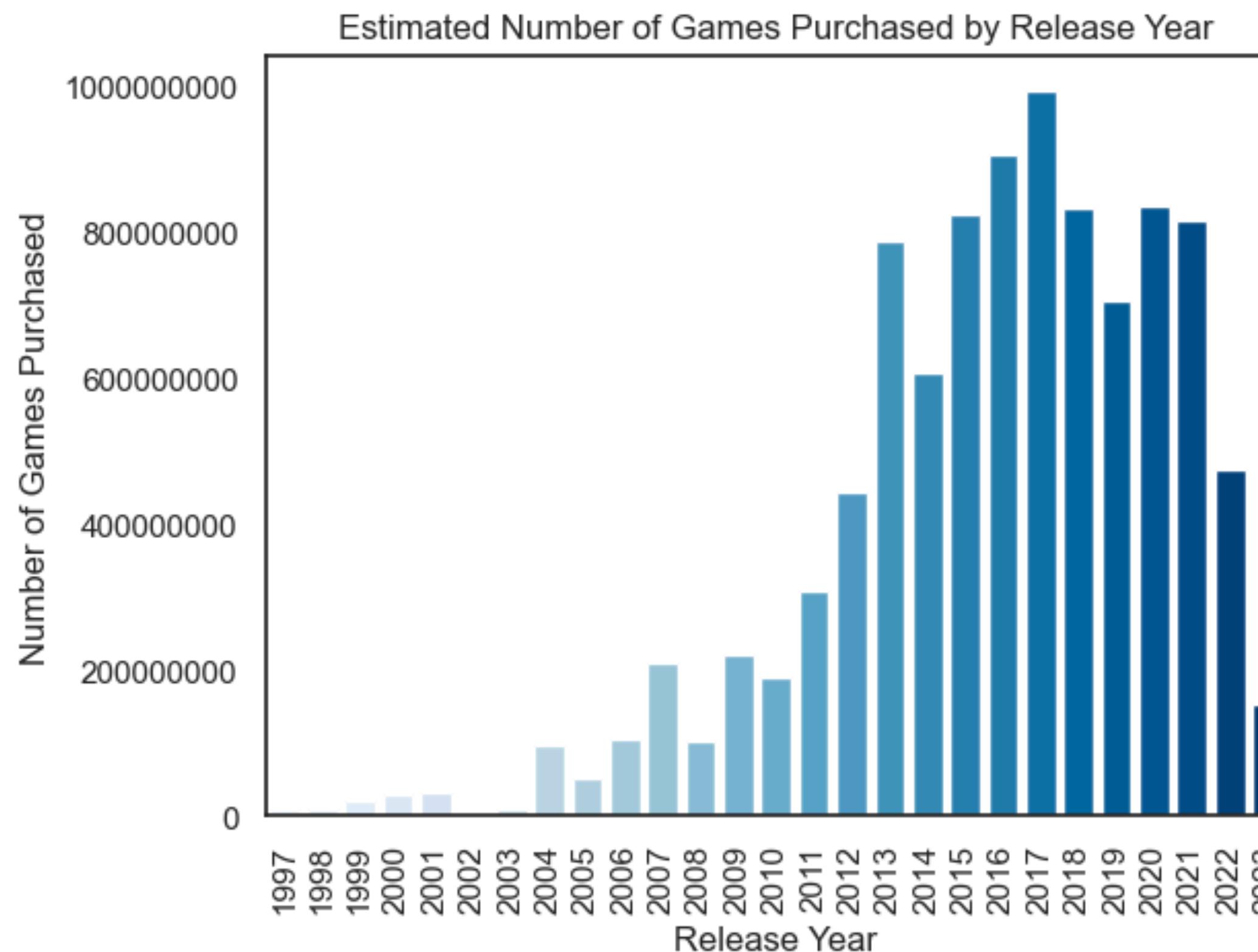


1. Video Game Recommendations

I analyzed and visualized over **76,000+ video game titles**, identifying general trends and factors predictive of purchases using linear and random forest regressions. I then built a **content-based recommender** that can provide similar high-rated games to any title available on Steam.

Link: <https://aedanyue.files.wordpress.com/2023/08/steamgames-2.pdf>

Estimated: 10 billion game copies sold on Steam



Example: "Slay the Spire"

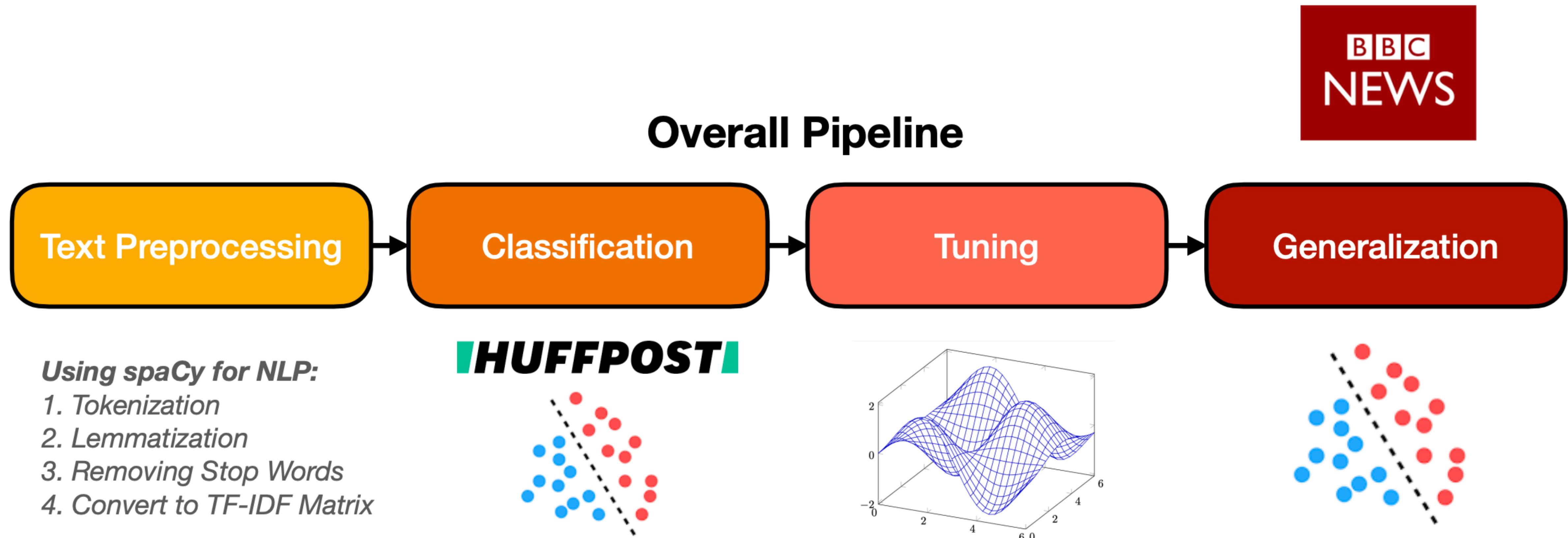
```
game_recommender("Slay the Spire", 0.85, 50, 10)
```

	Price	Proportion_Positive	Total_Reviews	Similarity
Blood Card 2: Dark Mist	5.99	0.863208	212	0.900000
Dicey Dungeons	14.99	0.902158	8340	0.850000
Iris and the Giant	17.99	0.888778	998	0.800000
Roguebook	24.99	0.850710	2465	0.800000
Across the Obelisk	19.99	0.941207	1956	0.750000
Card Quest	9.99	0.881295	278	0.750000
Poker Quest	14.99	0.926554	354	0.750000
Legend Creatures(传奇生物)	4.99	0.909014	3539	0.726722
Erannorth Reborn	19.99	0.863372	344	0.700000
Gordian Quest	19.99	0.918421	4180	0.700000
Knock on the Coffin Lid	24.99	0.863158	475	0.700000

2. Text Content Classification

I built a **content-based classifier** using 22000+ online newspaper headlines, tuned the classifier on an imbalanced class label (1:10 ratio), and then generalized it to a **new dataset without labels**. This project successfully predicted “Science” articles from BBC news headlines.

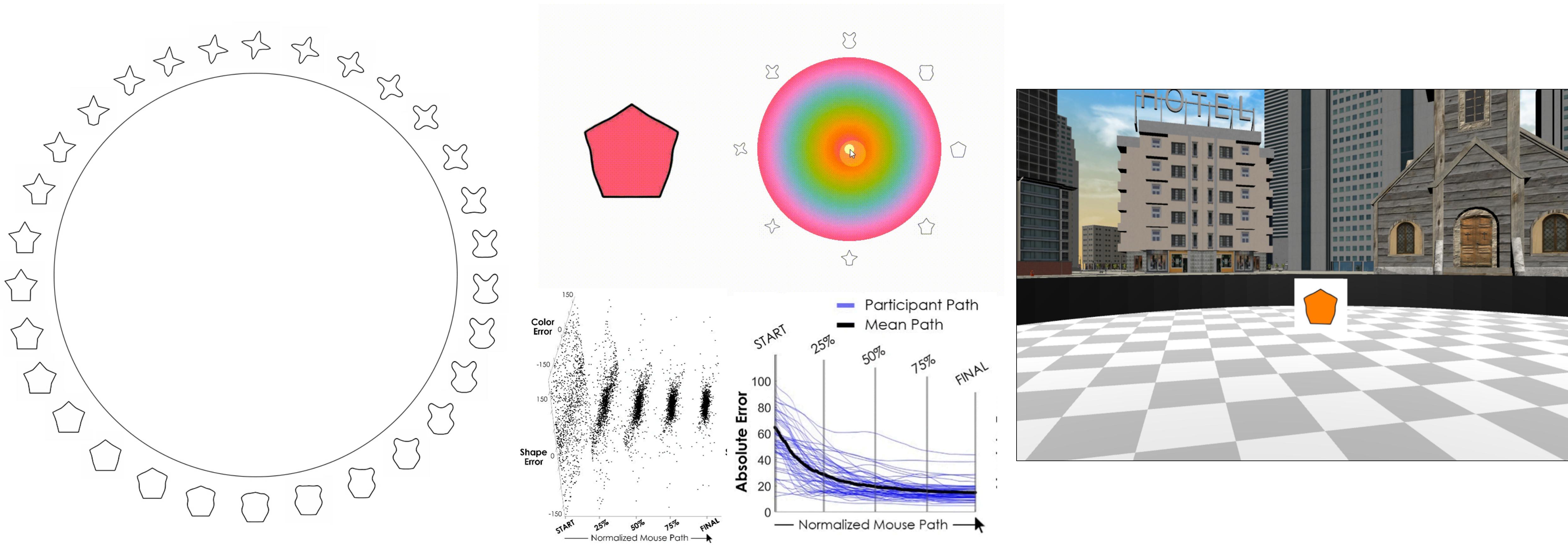
Link: <https://aedanyue.files.wordpress.com/2023/08/textclassification-2.pdf>



3. Studying Memory with Real-Time Temporal Dynamics

Encompassing several projects, this work developed a new method to measure human memory continuously using mouse cursor movements over a 2D object embedding. I then generalized the approach to virtual reality, with initial results showing that this task can **effectively screen older adults at risk for dementia**.

Link: https://aedanyue.files.wordpress.com/2023/08/project3_ayl.pdf

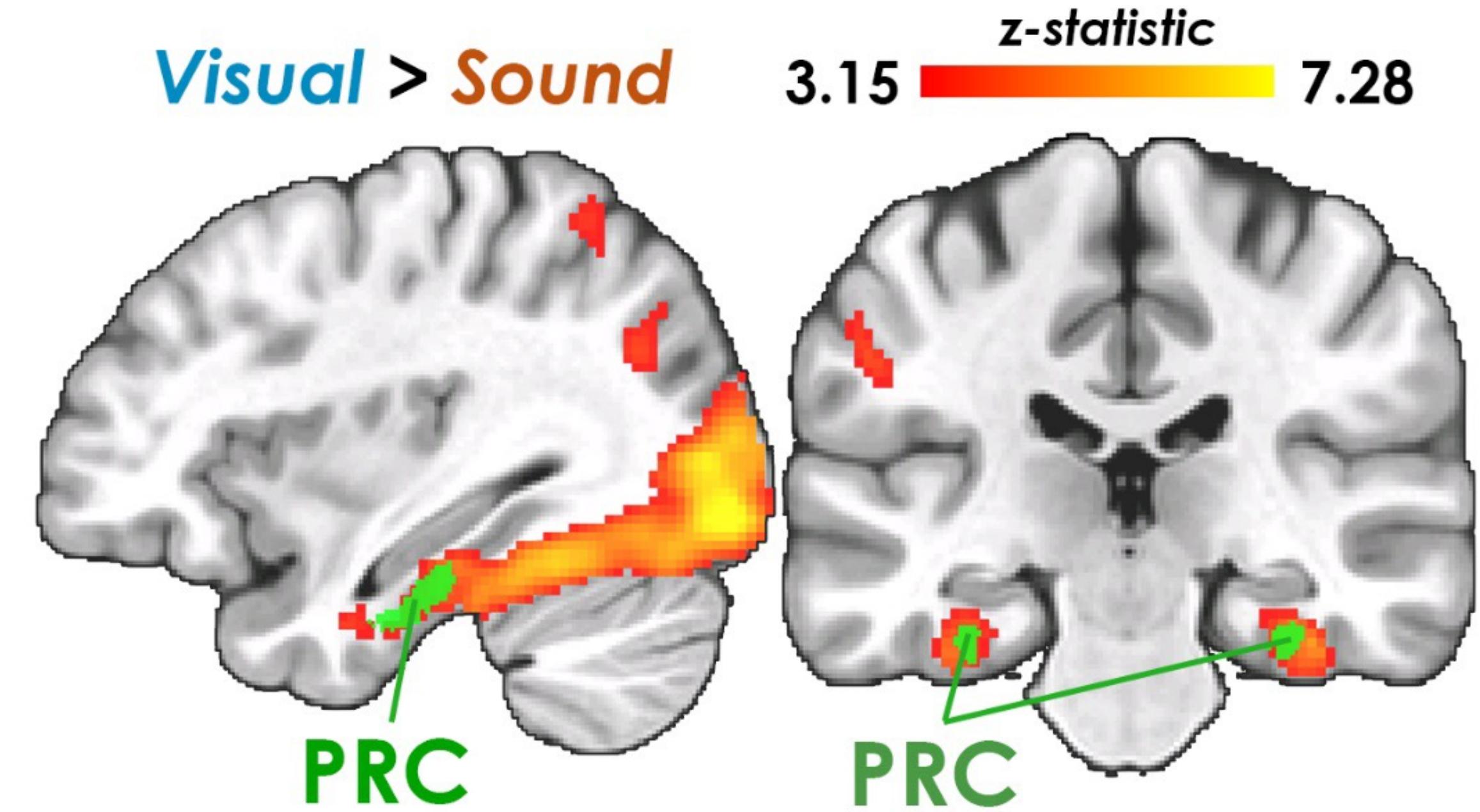
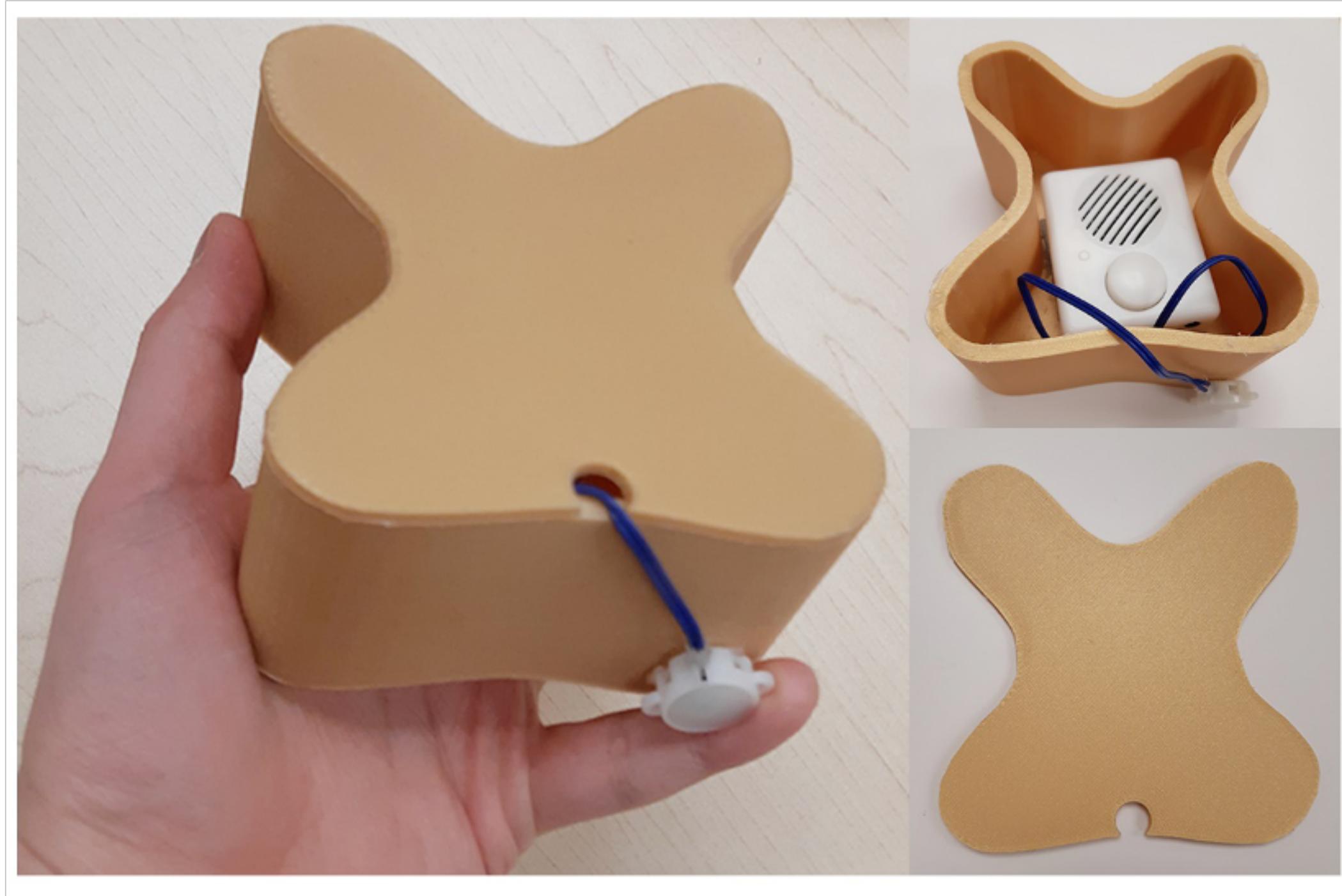


4. How Does the Brain Create New Concepts?

This neuroimaging research studied the **multimodal binding problem**, asking how the mind combines the multiple senses (e.g., from our eyes and ears) into a coherent object concept. I built a cutting-edge **multi-echo fMRI data pipeline**, and then recorded brain activity as participants learned new 3D-printed objects.

Link: https://aedanyue.files.wordpress.com/2023/08/project4_ayl.pdf

3D-Printed Shapes with Embedded Speakers



5. Brain Inspired Neural Network Architecture

Build from my findings in Project 4, this ongoing work aims to develop a brain inspired architecture for artificial neural networks during object classification. We can use what we know about how the brain classifies object concepts to **inform how we design our neural networks** to classify shape-sound objects.

Link: https://aedanyue.files.wordpress.com/2023/08/project5_ayl.pdf

