

2019 Undergraduate Research Symposium

Best Project

Awarded to: Xinyi Xu

Project Topic: A Model of Curvature Blindness

Mentor: Jeffrey Erlich

Abstract We investigated the mechanism of curvature blindness illusion reported by Takahashi in 2017, where a wavy line is perceived as a zigzag one with specific contrast polarity. Based on current knowledge of visual system, our model explored possible pathways for corner and curve perception.

In the first model under Occam's razor, Bayesian inference was applied for a mathematical description of the encoding and decoding model of the stimulus. Gaussian process was implemented to represent the smooth noise in the brain. For a more sophisticated model emulating neural pathway of human vision, we applied the existing linear-nonlinear-Poisson (LNP) model to transform an illusory image into the corresponding neuron spike count, encoding the image in multiple orientations. The information was passed through principal component analysis and logistic regression to stimulate human response to a given image.

Most Popular Project

Awarded to: Jingtian Zong, Yufeng Zhao, Jingyi Wang, Jianghao Hu, Ziwei Liu

Project Topic: *Tang Long* - Filming Middle-aged LGBTQ in Shanghai

Mentor: Ann Chen

Abstract *Tang Long* is a short documentary under the topic of LGBTQ. The film takes Tang Long, a 40-year-old homosexual man who lives in Shanghai as the entry point, aiming to present one side of middle-aged LGBTQ people's lives in Shanghai. The film tracks Tang Long and his male partner's ordinary summer life at home, in a suburb area of Shanghai, and tells their life stories.