

# Noise-Induced Randomization in Regression Discontinuity Designs

Dean Eckles, Nikolaos Ignatiadis, Stefan Wager, Han Wu

Presented by: Sai Zhang

November 18, 2022

# Outline

## 1 Estimation

# Estimation

# Estimation of Weighted Treatment Effects

## Proposition 1

Let  $\gamma_+(\cdot), \gamma_-(\cdot)$  be measurable functions of  $Z$ , then under A1-A3:

$$\mathbb{E}[\gamma_+(Z)Y] = \mathbb{E}[\alpha_{(1)}(U)h(U, \gamma_+)], \quad \mathbb{E}[\gamma_-(Z)Y] = \mathbb{E}[\alpha_{(0)}(U)h(U, \gamma_-)]$$

where  $h(u, \gamma) := \int \gamma(z) p(z | u) d\lambda(z)$ ,  $\alpha_{(w)}(u) = \mathbb{E}[Y_i(w) | U_i = u]$

# References I

Eckles, D., Ignatiadis, N., Wager, S., & Wu, H. (2020). Noise-induced randomization in regression discontinuity designs. *arXiv preprint arXiv:2004.09458*.

Thank you!