**First Annual CodeChella**

**Difference-in-Differences**

**Description:** Econometricians have been hard at work over the last 4-5 years dissecting common workhorse models in the difference-in-differences design such as twoway fixed effects, as well as procedures such as event studies. A lot has been learned, and a lot of software is now available. Cunningham is teaching a workshop that will provide an introduction to this material which when combined with software examples should (he hopes) provide you with confidence and competency in going forward with your research using difference-in-differences, fixed effects estimators, as well as alternative estimators that we will discuss. The following represents what he is tentatively planning to cover.

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| **Workshop 1** | **Workshop 2** |
| **Friday July 16th, 2021** | **Friday July 23, 2021** |
| **9:00am to 2:00pm Central standard time** | **3:00am to 8:00am Central standard time**  **9:00am to 3:00pm United Kingdom**  **5:00pm to 11:00pm Asia**  **10:00am to 3:00pm Egypt time**  **8:00pm to 1:00am New Zealand time** |

Workshop is aimed at the American market. Workshop 2 is aimed at the rest of the world. I tried to find a way to coordinate across many different markets, but New Zealand/Australia creates some challenges, so I went with what I hope was a good compromise.

**Readings**: Mostly just read what I’ve written on my substack, Causal Inference: the Remix, as those have short reviews plus they have links to the articles below at my substack as well as embedded in the outline. I am storing this at my github below.

<https://causalinf.substack.com>

**Code, Data, Articles and Slides:**

<https://github.com/scunning1975/codechella.git>

**Outline:**

1. Potential outcomes review
2. Two group case
   1. History (John Snow, Ashenfelt, Card and Krueger, etc.)
   2. Two by two designs with and without regressions
   3. Covariates
      1. Abadie 2005;
      2. Callaway and Zhao 2020
   4. Standard event studies
      1. Miller et al 2020
3. Differential timing, twoway fixed effects and the static specification
   1. Early hints:
      1. Wooldridge (2003);
      2. Wolfers (2006);
      3. Meer and West (2015)
   2. Twoway fixed effects:
      1. Goodman-Bacon (2021)
      2. Barusyak, Jaravel and Spiess (2020)
   3. Alternative estimators:
      1. De Chaisemartin and D’Haultfeœille (2020)
      2. Callaway and Sant’Anna (2020)
      3. Stacking (Cingiz, Dube and Zipperer 2018)
   4. Case study: Baker, et al. (2021)
4. Differential timing and the event study
   1. Critique:
      1. Barusyak, Jaravel and Spiess (2021)
      2. Sun and Abraham (2020)
   2. Weighted cohort-time ATT:
      1. Sun and Abraham (2020)
      2. Callaway and Sant’Anna (2020)
5. Imputation estimators
   1. Barusyak, Jaravel and Spiess (2021)
   2. Gardner (2021)
6. Parallel trends
   1. Pre-testing: Roth (2020)
   2. Parallel trends and functional forms: Roth and Sant’Anna (2021)
   3. Honest approaches: Rambachan and Roth (2020)
7. Fuzzy did and continuous treatments:
   1. de Chaisemartin and D’Haultfœille (2017)

Others we may study:

Athey, et al. (2017) “Matrix completion for panel data”

Athey and Imbens (2018) “Design-Based Analysis in Difference-in-differences

Athey and Imbens (2006) “Identification and inference in nonlinear difference in differences models” (the changes-in-changes estimator)

Arkhangelsky, et al. “Synthetic Difference in Differences”