

# Eltecon Data Science Course by Emarsys

## Measuring uncertainty

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# Homeworks from last week

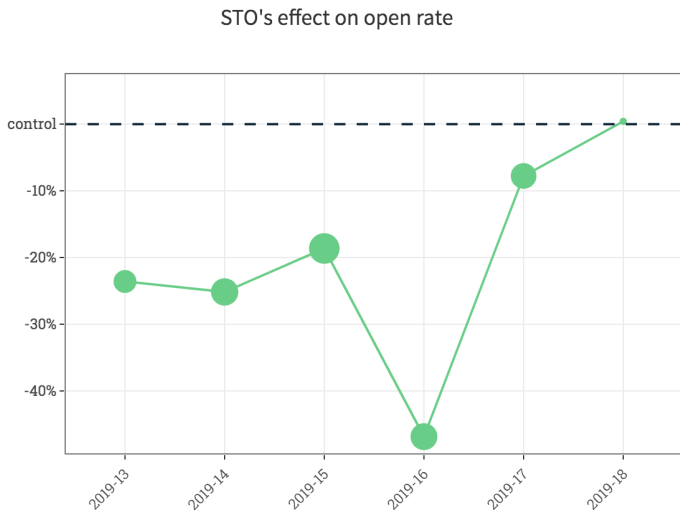
**Any questions about final project?**

# Measuring uncertainty

# We can always measure something from our data...

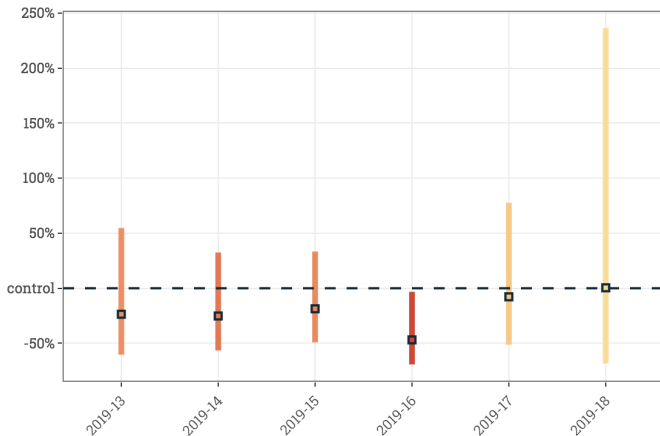
... but how sure can we be about our measurement?

# We can always measure something from our data...



# But not necessarily significant!

STO's effect on open rate



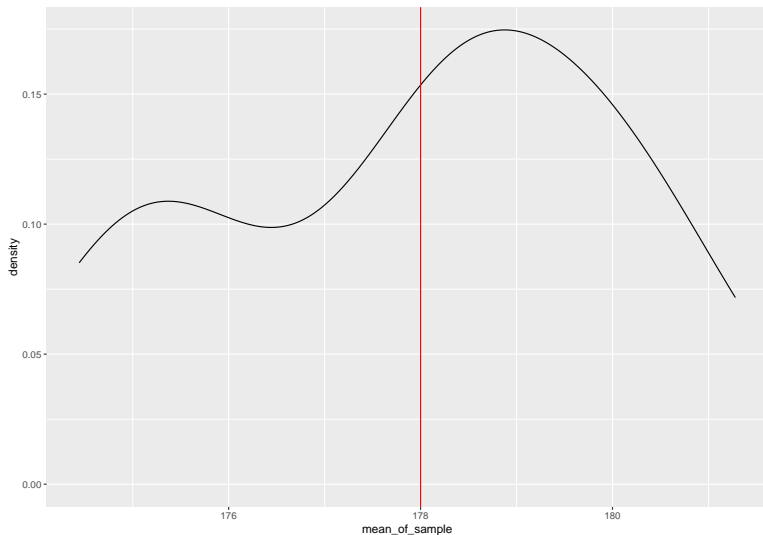
# Why do we have uncertainty in the measurement?

- If you knew the whole population, there wouldn't be uncertainty in your measurement
- But we only see 1 'segment' of the data = we have a sample of the population



# Sampling from a population

# Distribution of sample means - the CLT



# What are the key assumptions?

FIXME check this!!!! - i.i.d. sampling - finite variance

# How can we calculate uncertainty to our measurement?

- Based on variance of known distribution
- Monte-Carlo method
- Bootstrapping
- (and other methods as well of course)