

CASE STUDY - VRS 2018/19

SPREADING THE GIGGLES: THE MATHS OF LAUGHTER



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A Giggle A Minute: The Maths of Laughter?

Who doesn't enjoy a night out at a comedy show? The build-up of tension and the shock of the punchline are designed to get a giggle. What can maths tell us about the spread of laughter?

Vacation Research Scholarship recipient, Theresa O'Brien has been working on a project to investigate laughter propagation in a comedy audience through an agent-based modelling framework. This research aims to define audience behaviour using a mixture of mathematical equations and stochastic processes to reflect the somewhat random, and intensely social, experience of comedy. Each audience member will be embedded in a weighted directed graph which represents people in spatial and social proximity through edge weighting, while the build-up to a punchline, and the punchline itself, are environmental factors experienced by all agents at the same time.

Crunching the Numbers

Theresa is building a computer simulation of a comedy audience that represents people as programs called agents. These agents are either laughing or not in response to both a punchline being delivered, and the other audience members around them laughing. For the joke being told she uses equations that behave like a punch line: they start at 0, have a sudden spike, and then drop back to 0. The social effect is represented as a network connecting people in the audience that includes information about how far audience members are from each other.

A core part of this project is checking whether the simulation behaves like people in the real world. To do this Theresa collected recordings of stand-up comedy and used the volume of laughter as a way of estimating how much of the audience was laughing. She will compare the proportion of the simulated audience against the real-world data to see if the model is realistic.

Quotes – Theresa O'Brien

"This research helps us to understand contagious social behaviour. Laughter is one type, but there are others like information and opinion spread in social networks and this research may have extensions to those."

"The VRS experience has been a fantastic space for me use my broad interdisciplinary background in social science as well as maths and stats. I have gained a lot of insight into how hard it is to model social behaviour with maths, because humans don't lend themselves to this kind of research very well. We have to be really careful to not overstate our results and to verify our models because it's much easier to program something completely unrealistic and disconnected from reality than something that reflects what people actually do."

"There is a lot of future research potential in this project. My hope is to publish a paper out of what we have so far. I plan to do more work in this field, namely mathematical modelling in social science, even if it isn't related to this specific project."