Who am I?

- B.Sc in Pure Math and Statistics at University of Sydney
- Ph.D in S&DS at Yale University
- Lecturer in Statistics & Data Science at Yale University
- My favorite students call me Professor Feng
Kernel Estimation for a Nonparametric Cointegrating Regression Model

Derek Feng

An essay submitted in partial fulfillment of the requirements for the degree of B.Sc. (Honours)

Statistics
University of Sydney

December 2011
The Unreasonable Effectiveness of Conditioning
in Statistical Network Analysis

A Dissertation
Presented to the Faculty of the Graduate School
of
Yale University
in Candidacy for the Degree of
Doctor of Philosophy

by
Derek Feng

Dissertation Director: Harrison H. Zhou

December, 2018
My Goal

- Make you guys see the beauty in (social) science.
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- Economics/Psychology/Statistics > IR
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- Make you guys see the beauty in (social) science.
- Economics/Psychology/Statistics > IR
- Yale > Oxford
USA > UK if ?
Basic Concepts of Economics (Today)
Social Networks (?)
Machine Learning & Artificial Intelligence &
International Trade (Kevin)
Financial Markets (Kevin)
Game Theory (Joost)
Business (Nick)
What this course is not?

- This course is not going to be a condensed version of a typical ECON101 class.
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- I will not be giving you just a list of facts to write down and memorize.
- Don’t be shy about participating. The best way to learn is to engage with the topic.
What is Economics?
Question
Under what circumstances does individual optimization lead to outcomes that are good for the group as a whole?
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- Markets / "Invisible Hand"
- Business (Decisions)
- Game Theory
Why do economies grow, and how to make sure they don’t crash?
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- Money
- Unemployment
- Inflation/Interest Rates
- Global Trade
- Economic Growth
- Climate Change
Why do economies grow, and how to make sure they don’t crash?

No one really knows.
Abstract
We consider the problem of nonparametric functional estimation in a nonlinear cointegration model with errors modelled by a linear process. Kernel estimation in this context is made complicated by the wandering characteristics of the regressors. We employ local time density arguments to establish asymptotic properties of the kernel estimator. Both the results and the methods are applicable to a range of empirical applications.
Assumption in Economics: Humans are Rational Agents.
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Economics is the study of choices in the presence of scarcity.
Scarsity: tension between infinite wants and finite resources
What is Economics?

Economics provides insights to help answer the following types of questions:

- Should I have cereal or oats in the morning?
- Planned Economy vs Free Market?
- What government interventions are useful to prevent a company from going into a recession?
- Is a minimum wage a good idea?
Economics is everywhere

You did Economics when you walked into this classroom.
Economics is everywhere

You did Economics when you walked into this classroom. You made a choice to wake up and come here, instead of sleeping in.
Markets (Planned vs Free)
Who decides the price of milk?
Planned Economy: the State.
A Planned Economy is an economic system in which the government controls and regulates production, distribution, prices, etc.
What are some advantages or disadvantages of a Planned Economy?
Markets

(Free Markets) are a miracle in collective "intelligence".
Collective (Swarm) Intelligences
Termites
Termites are not particularly intelligent, lacking memory and the ability to learn.
Termites

- Put a few termites into a petri dish and they wander around aimlessly
- Put in forty and they start stampeding around the dish's perimeter like a herd.
- But put enough termites together (millions), in the right conditions, and they will build you a cathedral.
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Why am I telling you about stupid ants??

The creation of termite mounds = going to the supermarket and buying milk.
Suppose you have buyers and sellers of milk. This defines a Market.
How is the price of milk decided in a market?
Law of Demand

What happens to demand as price increases?
Law of Demand

What happens to demand as price increases?

- Substitution Effect
- Income Effect
- Law of Diminishing Marginal Utility
Shifts in Demand

1. Tastes/Preferences
2. Number of Consumers
3. Price of Related Goods
4. Change in Expectations
Law of Supply

What happens to supply as price increases?
Shifts in Supply

- Price of Resources
- Number of Produces
- Technology
- Taxes & Subsidies
- Future Expectations
Where the two curves meet is called the Market Equilibrium Price.
What happens when the price is above the market price?
What happens when the price is above the market price? Surplus.
What happens when the price is above the market price?
What happens when the price is above the market price? Shortage.