ARNAV SOOD

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EMPLOYMENT HISTORY

Predoctoral Researcher, **University of British Columbia** Jun. 2018 — Jun. 2020
Advisor: Prof. Jesse Perla

Lead Developer, **QuantEcon** Jan. 2019 — Present
References: Prof. John Stachurski, Dr. Matt McKay, Dr. Chase Coleman

Research Assistant, **Prof. Laura Veldkamp** May. 2016 — Jan. 2018

EDUCATION

University of British Columbia Jun. 2018 — Jun. 2020
Selected Courses (MS and BA.)

New York University Sep. 2014 — May 2018
Bachelor of Arts (Math.)
Minors in Economics, Philosophy

PUBLICATIONS

Exploiting Symmetry in High-Dimensional Dynamic Programming In-Progress
(with Jesse Perla, Mahdi Kahou, Jesús Fernández-Villaverde)

We provide a new method for solving high-dimensional dynamic programming problems, and recursive competitive equilibria with a very large (but finite) number of heterogenous agents. The "curse of dimensionality" is avoided due to three complementary techniques: (1) exploiting symmetry in the approximate law of motion and the value function when designing deep learning approximations; (2) constructing a concentration of measure to calculate high-dimensional expectations using only a *single* Monte-Carlo draw for all idiosyncratic shocks; and (3) sampling methods to ensure the model fits along manifolds of interest.

RESEARCH ASSISTANTSHIPS AND SOFTWARE

Equilibrium Technology Diffusion, Trade, and Growth

- Co-wrote Julia code which solves a forward-looking differential system in steady-state, and computes transition dynamics in response to shocks.

Optimal Stopping and Linear Complementarity

- A short note with my advisor about how Optimal Stopping Problems (OSPs) can be reformulated as linear complementarity problems (LCPs), as opposed to the traditional Bellman-style approach.

QuantEcon Julia Lectures

- Wrote new lectures, overhauled code, deployed to cloud backends, and supervised RAs.

QuantEcon/Expectations.jl

- Uses Gaussian quadrature to take expectations for increased clarity, speed, and accuracy. Accepted as a poster at JuliaCon 2020.

QuantEcon/InstantiateFromURL.jl

- Allows Julia Jupyter notebooks to run anywhere with proper package versions. Accepted as a talk at JuliaCon 2020 and used in QuantEcon lectures.

VSE Syzygy JupyterHub

- Worked with Dr. Ian Allison of PIMS to maintain a JupyterHub server for faculty and student use. Deployed from Docker for reproducible setup.