

# HYEONGYUL ROH

4331 Nelson Hall, 2801 Founders Drive  
Raleigh, North Carolina, 27695, USA  
(240) · 475 · 1355 ◊ hroh@ncsu.edu

## RESEARCH INTEREST

---

Environmental and Resource Economics, Energy Economics, Applied Econometrics  
Machine Learning, Dynamic Programming and Bayesian Statistics

## EDUCATION

---

**North Carolina State University**  
*Ph.D. candidate in Economics*

Expected Graduation Date: May 2018

- Dissertation: "Three Essays on Environmental and Energy Economics"
- Committee: Harrison Fell (Chair), Zachary Brown, Bob Hammond, Denis Pelletier

**Boston University**  
Master of Science in Mathematical Finance

September 2009

**Inha University**  
Bachelor of Arts in Economics

August 2007

## WORKING PAPERS

---

**"Transition to Clean Technology in the Deregulated Electricity Industry: Machine Learning Methods for Estimating Dynamic Response and Causal Inference"** (Job Market Paper)

- Estimated how recent dramatic changes to the U.S. electricity market, through increased wind generation and falling natural gas prices, altered the ability of conventional generators to exercise market power
- Measured the economic value of intermittent renewable energy and controllable energy resources
- Implemented artificial neural network design to replicate industrial dynamics with high-frequency data

**"Adaptive Resistance Management with Uncertain Fitness Cost"** (with Zachary Brown)

- Employed mathematical adaptive management methods to improve the optimal control of evolutionary dynamics governing resistance to Bt crops
- Analyzed and computed the 'value of information' yielded by adaptive resistance management and 'adaptive marginal user costs'

**"Risk-based Inspection Resource Allocation Model"**

- Estimated a mixture distribution for the marginal benefits of roadside inspections in North Carolina
- Found monthly optimal inspection resource (state highway patrols) allocation plan to maximize expected inspection benefits
- Found estimated benefits of optimal allocation plan approximately 20 - 30 million dollars per year

**"An Estimate of Lives Saved by Enforcement of Seat Belt Usage in North Carolina"**

- Employed Bayesian analysis to estimate probability of fatal crashes for unbelted persons
- Found the enforcements saved 6.42 - 7.03 lives in 2014, which translated to a yearly savings of \$60 - \$66 million based on USDOT's VSL estimates

## RESEARCH IN PROGRESS

---

- "Understanding Bidding Strategy in Electricity Reserve Market"
- "Dynamic Response to Environmental Regulation in Deregulated Electricity Industry"
- "Dynamic Optimization of Wolbachia Release"

## RESEARCH EXPERIENCE

---

**Institute of Transportation Research and Education** Centennial Campus in NCSU  
*Modeling Analyst (part-time)* December 2015 - Present

- Manipulated, interpreted, and presented roadside commercial motor vehicle inspection data from Jan 2009 to present in North Carolina
- Found optimal the inspection resource (State Highway Patrol) plans
- Participated in the projects about evaluation of NC state highway patrols and salary equity study

**North Carolina State University** Raleigh, North Carolina  
*Research Assistant, Dr. Zachary Brown* August 2015 - Present

- Solved stochastic dynamic programming model on Wolbachia mosquito release to prevent transmission and spread of dengue

**Massachusetts Institute of Technology** Cambridge, Massachusetts  
*Graduate Special Student (full-time)* February 2010 - June 2010

- Participated in project about non-linear programming of convex set in financial setting: multi-account portfolio rebalancing problem with a fair split of trading costs

## TEACHING EXPERIENCE

---

**North Carolina State University** Raleigh, North Carolina  
*Instructor* August 2016 - Present

- Introduction to Agricultural and Resource Economics (ARE 201)

*Lab Instructor* January 2015 - May 2016

- Fundamental of Economics (EC 205)
- Agricultural Business Management (ARE 104)

## PROFESSIONAL EXPERIENCE

---

**KOAS** Seoul, South Korea  
*International Business Team, Manager* February 2014 - December 2014

**SK Financial Securities Company** Seoul, South Korea  
*Bond Management & Cooperation Research Team, Assistant Analyst* June 2007 - December 2007

**KOAS** Seoul, South Korea  
*Investor Relations & Finance Team, Assistant Manager* June 2004 - July 2006

## PRESENTATIONS

---

**2017** AERE Summer Conference, Pittsburgh, PA, General Session (expected)  
*'Transition to Clean Technology and Market Power in the Deregulated Electricity Industry: Machine Learning Methods for Estimating Dynamic Response and Causal Inference'*

**2016** Int. Conf. on Advances in Interdisciplinary Statistics and Combinatorics, Greensboro, NC  
*'Adaptive Resistance Management with Uncertain Fitness Cost'* with Z. Brown  
CEnREP Colloquium, North Carolina State University  
*'Adaptive Resistance Management with Uncertain Fitness Cost'* with Z. Brown

## HONORS & AWARDS

---

**2017-2018**      Jenkins Fellowship  
**2014-2017**      NCSU Graduate Supplemental Assistantship

## TECHNICAL STRENGTH

---

**Programming**      Matlab, C/C++, Mathematica, PostgreSQL, R, SAS, WinBUGS  
**Other tools**         $\LaTeX$ , MS Office

## ADDITIONAL

---

**Citizenship**        Korean Citizen & U.S. Permanent Resident  
**Languages**         English, Korean  
**Military Services**    Corporal, Korean Army, 2001 - 2003 (Mandatory in Korea)