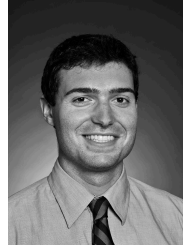


ROSS D. COLLINS

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OBJECTIVE

To develop and apply my skills in systems modeling, economic theory and policy analysis to research and teach the interconnected, multi-disciplinary components that shape complex energy and environmental decisions.

EDUCATION

Massachusetts Institute of Technology (MIT) Cambridge, MA, USA

Doctor of Philosophy (PhD) in Engineering Systems, exp. Spring 2015 (5.0/5.0)

- Dissertation topic: Infrastructure system design for sustainable development – theory and application
- Doctoral committee: Olivier de Weck, Noelle Selin, Stephen Connors, William C. Clark
- Fellowships:
 - MIT Martin Family Fellow for Sustainability (2014 – 15)
 - Harvard Sustainability Science Doctoral Fellow (2014 – 15)
 - National Science Foundation Graduate Research Fellow (2010 – 11, 2012 – 14)

Master of Science (SM) in Technology and Policy, 2012 (5.0/5.0)

- Thesis topic: Forest fire management using models of social and physical dynamics
- Advisor: Prof. Richard de Neufville, MIT Portugal Program

University of Virginia (UVa) Charlottesville, VA, USA

Master of Science (MS) in Systems Engineering with Highest Honors, 2010 (3.9/4.0)

- Thesis topic: Systems modeling and risk analysis of distributed photovoltaic generation
- Advisor: Prof. Yacov Haimen, Center for Risk Management of Engineering Systems

Bachelor of Science (BS) in Systems Engineering and Economics with Honors, 2008 (3.6/4.0)

- Thesis topic: Economic loss modeling due to worker absenteeism during pandemic flu outbreak

RESEARCH

Harvard Sustainability Science Program Cambridge

Doctoral Fellow Sep 2014 – present

- Leading a working group on models/methods for sustainability evaluation of technologies and policies
- Assisting with Kennedy School of Gov't course, Policy Analysis + Design for Sustainable Development

Center for Complex Engineering Systems at KACST-MIT Cambridge & Saudi Arabia

Graduate Research Assistant Aug 2012 – present

- Developing simulation model for evaluation of coupled water and power infrastructures; quantifying tradeoffs between short-term capital spending and long-term macroeconomic impact of strategies
- Led the power infrastructure modeling and simulation work of 3 Saudi researchers over one year project
- Helped secure \$1.4M for follow-on phase of collaboration by contributing to annual report and proposal

MIT Portugal Program Cambridge & Portugal

Graduate Research Assistant Sep 2010 – May 2012

- Collaborated with 3 Portuguese universities, paper industry, and multiple national authorities on improving country-wide forest fire prevention and response in Portugal
- Developed model linking social drivers with forest processes to evaluate long-term efficacy of policies

- Interviewed major stakeholders during 2 months of field work in various regions of Portugal

SJTU Institute of Refrigeration and Cryogenics

Shanghai, China

Research Intern

Summer 2010

- Collaborated with Chinese students and faculty to evaluate benefits/costs of solar thermal technologies
- Analyzed markets and government policies relating to solar thermal development in the US and China

UVa Center for Risk Management of Engineering Systems

Charlottesville

Graduate Research Assistant

Aug 2008 – May 2010

- Developed risk quantification model of US critical infrastructure assets for Dept. of Homeland Security
- Implemented cyber risk scoring method for Va Dept. of Transportation’s sensitive IT systems
- Advised team of 3 undergraduate seniors on their capstone design project that evaluated feasibility of critical infrastructure information sharing in Virginia to mitigate consequences of disasters

UVa Center for Risk Management of Engineering Systems

Charlottesville

Undergraduate Research Assistant

Summer 2006, 2007

- Developed model that estimated economic losses from worker absenteeism during pandemic flu outbreak
- Produced Virginia-customized decomposition of transportation emergency support functions
- Drafted documents to help revise the current Virginia Emergency Operations Plan
- Built website to evaluate compliance of state and local authorities to federal preparedness standards

WORK EXPERIENCE

IHS Cambridge Energy Research Associates (CERA)

Cambridge

Contractor

Aug 2012 – May 2014

- Organized Energy Innovation Pioneers program at CERAWEEK – the annual executive conference
- Managed outreach to 300+ companies and entrepreneurs in oil & gas, renewable, and efficiency markets

U.S. House of Representatives

Washington DC

Congressional Fellow

Summer 2012

- Researched issues on water-energy nexus in U.S. electric power industry to inform legislative agenda of Subcommittee on Water & Power, Democrats within Committee on Natural Resources (NR)
- Drafted letters and memos for Personal Office of Rep. Ed Markey, Ranking Member of NR

Ash Center for Democratic Governance and Innovation

Cambridge

Research Assistant

Summer 2005

- Coordinated outreach toward innovative government programs; built database for managing candidates

PUBLICATIONS

Refereed Journal Articles (Published)

- **Collins, R.** (2014). My Vision for the Decade of Sustainable Energy for All (2014-2024). *Global Energy Affairs*, 2(1), 18-19. Global Energy Initiative.
- **Collins, R.,** de Neufville, R., Claro, J., Oliveira, T. & Pacheco, A. (2013). Forest fire management to avoid unintended consequences: a case study of Portugal using system dynamics. *Journal of Environmental Management*, 130, 1-9.
- **Collins, R. & Crowther, K.** (2011). Systems-based modeling of generation variability under alternate geographic configurations of photovoltaic installations in Virginia. *Energy Policy*, 39(10), 6262-6270.

Refereed Journal Articles (Unpublished)

- **Collins, R.,** Connors, S. & de Weck, O. (2014). Integrated water and energy infrastructure planning in the Kingdom of Saudi Arabia using a system dynamics model. *Energy Policy* (In Preparation).

Conference Papers

- **Collins, R.** (2014). Using inclusive wealth for dynamic analyses of sustainable development: Theory, reflection and application. In *Proceedings of the 32nd International Conference of the System Dynamics Society*. Delft, Netherlands.
- **Collins, R.**, Gowharji, W., Habib, A., Alwajeih, R. & Connors, R. (2013). Evaluating scenarios of capacity expansion given high seasonal variability of electricity demand: the case of Saudi Arabia. In *Proceedings of the 31st International Conference of the System Dynamics Society*. Cambridge, MA.
- Dyke, C., J. Johnson, N. Revenko, **R. Collins**, M. Hamilton, M. Vedomske, K.G. Crowther (2009). Feasibility analysis of critical infrastructure information sharing in Virginia. *Proceedings of the 2009 IEEE Systems and Information Engineering Design Symposium (SIEDS)*. Charlottesville, VA.
- Cahill, B., **R. Collins**, R. Jurko, T. Zivic, K. Crowther, Y. Haimes (2008). Collaborative risk-based preparedness for pandemic influenza in Southeastern Virginia. *Proceedings of the 2008 IEEE SIEDS*. Charlottesville, VA. (**Best paper award** in the Risk and Regional Planning Track)

Technical Reports

- **Collins, R.**, Sakhrani, V., Selin, N., Alsaati, A. & Strzepek, K. (2014). Using inclusive wealth for policy evaluation: the case of infrastructure capital. In *Inclusive Wealth Report 2014*. Cambridge, UK: Cambridge University Press (In Press).
- Selin, N., Strzepek, K., Connors, S., McCluskey, A., Couzo, E., Alawad, A., Alhassan, A., **Collins, R.** & Czaika, E. (2014). Sustainable Infrastructure Planning Systems Phase 2 (SIPS2). Annual Report. CCES-KACST, Riyadh, Saudi Arabia.
- Almahmoud, J., Nouh, M., Sanchez, A., Williams, J., Alwajeih, R., **Collins, R.**, Connors, S., Gowharji, W. & Habib, A. (2013). Integrated Energy Decision Support System (IEDSS) Annual and Final Reports. CCES-KACST, Riyadh, Saudi Arabia.
- Haimes, Y.Y., K.G. Crowther, J.H. Lambert, E. Andrijcic, J. Burke, **R. Collins**, E. Evans, M. Hamilton, S. Hwang, A. Pillutla, E. Rogerson, M. Vedomske, 2010. Systems-based Methodology for Risk Modeling and Assessment: Supporting the National Risk Profile. DHS, Washington, DC.
- Haimes, Y.Y., K.G. Crowther, **R. Collins**, M. Hamilton, S. Hwang, A. Murray, A. Pillutla, M. Vedomske, 2010. VDOT IT Risk Assessments Final Report: Methodology and best-practices in conducting risk assessments of IT sensitive systems for the Virginia Department of Transportation. VDOT, Richmond, VA.
- Haimes, Y.Y., K.G. Crowther, B.M. Horowitz, J.R. Santos, J.H. Lambert, A. Lee, B. Caswell, M. Orsi, S. Drake, K. Favreau, N. Magnum, S. McHail, A. Olesen, B. Cahill, **R. Collins**, R. Jurko, and T. Zivic, 2008. Regional Homeland Security: Framework for Balancing Preparedness with Resilience in the HRPD System of Interconnected Infrastructure Systems. In Critical Infrastructure Resilience for the Hampton Roads Region Final Report, Hampton, VA.
- Haimes, Y.Y., J.R. Santos, J.H. Lambert, B.M. Horowitz, K.G. Crowther, B. Caswell, **R. Collins**, M. Haggerty, and J. McLin, 2007. Virginia Critical Transportation Infrastructure Protection and Resilience. Virginia Transportation Research Council, Charlottesville, VA.

PRESENTATIONS AND LECTURES

- **Collins, R.**, 2014. The Youth and Green Innovation. Plenary panel session, presented at the World Green Economy Summit, April 2014, Dubai, UAE.
- **Collins, R.**, 2013. Defining, measuring and analyzing sustainability of systems: Literature review and application to natural resource management. Presented at the Technology, Management and Policy Consortium, June 2013, Cambridge, MA.
- **Collins, R.**, de Neufville, R., Claro, J., Oliveira, T., 2011. Suppression or Prevention: Modeling forest fire management using System Dynamics. Presented to the Annual Meeting of INFORMS, November 2011, Charlotte, NC.
- **Collins, R.** and M. Vedomske, 2010. Using the Fractile Method in Decision Analysis. Guest lecture to SYS 6050 Risk Analysis on February 9, 2010.

- **Collins, R.**, Crowther, K., 2010. Systems-based modeling of generation variability under alternate geographic configurations of photovoltaic installations in Virginia. Presented to the Annual Meeting of INFORMS, November 2010, Austin, TX.
- **Collins, R.** and M. Vedomske, 2009. Reliability and Fault Tree Analysis. Guest lectures to SYS 3001 The Art and Science of Systems Modeling on October 13 and 15, 2009.
- **Collins, R.**, 2009. A systems-driven, risk-informed evaluation of solar photovoltaic options in Virginia. Presented to the Annual Meeting of the Society for Risk Analysis, December 2009, Baltimore, MD.
- **Collins, R.**, Karvetski, C., Vedomske, M., 2009. Risk analysis of Boston snowstorms. Presented to the Annual Meeting of the Society for Risk Analysis, December 2009, Baltimore, MD.

PROFESSIONAL AFFILIATIONS

- System Dynamics Society, 2013 – present
- Active Referee for *Journal of Environmental Management*, 2013 – present
- Institute for Operations Research and the Management Sciences (INFORMS), 2009 – 2011
- Society for Risk Analysis (SRA), 2009 – 2011
- Institute of Electrical and Electronics Engineers (IEEE), 2009 – 2011

LEADERSHIP

Climate CoLab, MIT Center for Collective Intelligence <i>Fellow</i>	2014-present
• Working with former Sec. of State George Shultz to design/judge contest on US carbon price legislation	
MIT Engineering Systems Society <i>Co-President, Alumni Chair</i>	2013-present
• Managing student and alumni input concerning ESD reorganization, liaising with new director	
MIT Technology and Policy Student Society <i>President</i>	2011-2012
• Coordinated technology policy seminars, speaker series, outreach, recruitment, and socials	
MIT Science Policy Initiative <i>Congressional Chair</i>	2011-2012
• Organized institute-wide science advocacy effort for Congressional Visits Day in Washington, DC	
MIT Energy Conference <i>Logistics Coordinator</i>	2010-2012
• Facilitated activities of 100+ student organizers and 1,000+ participants at two conferences	
Tau Beta Pi Engineering Honor Society, UVa Chapter <i>Vice President</i>	2007-08
• Organized tutoring and career information sessions for undergraduate engineers	

ADDITIONAL AWARDS & HONORS

- Winner of 2013 Global Energy Initiative Essay Contest, 1st place out of 400 entries from 67 countries
- MIT Technology and Policy Best Thesis Award, Honorable Mention, 2012
- NSF International Research and Education in Engineering Program Award, Shanghai, China, 2010
- UVa Dept. of Systems & Information Eng. Louis T. Rader Outstanding Grad Student Award, 2010
- UVa Center for Risk Management of Engineering Systems Distinguished Grad Student Award, 2010
- UVa Engineering Research Symposium (UVERS) Best Poster Award, Honorable Mention, 2010
- UVa Dept. of Systems & Information Engineering Matthew David Wait Memorial Award, 2008

COMMUNITY SERVICE

Achieving Careers in Engineering and Science at MIT	2011
• Mentored local high school students on SAT test taking, college apps, and future high school coursework	
Middle and High School Science Fair Judge	2010, 2014
• Judged science projects at two regional fairs: Albemarle County, VA and Boston, MA	
UVa Campus Kitchens Project	2010
• Recovered food from UVa cafeterias to bring meals to Charlottesville community via Salvation Army	
UVa Monroe Society	2005 – 2007
• Led outreach for prospective students by facilitating overnight stays with current students on campus	

UVa Madison House

2006

- Coached 5th and 6th grade boys basketball team for the local Charlottesville YMCA

Habitat for Humanity

2003

- Volunteered with my hometown church to help build new housing developments in Miami, FL

RELEVANT COURSEWORK & SOFTWARE

- Math and Dynamic Programming (MatLab, GAMS, Excel Solver)
- Linear Statistical Models and Econometrics (R, S-Plus)
- Risk and Decision Analysis (@Risk and StatTools for Excel)
- System Dynamics (Vensim, AnyLogic)
- Discrete Event Simulation (Arena, AnyLogic)
- Data and Information Engineering (php, SQL)
- Computer Science (JAVA)
- GIS Methods (ArcGIS)
- Micro/Macro Economics for Public Policy
- Finance, certificate through Coursera.org

REFERENCES

Professor William C. Clark

Director, Harvard Sustainability Science Program; Harvey Brooks Professor of International Science, Public Policy and Human Development, Harvard University

william_clark@harvard.edu

<http://www.hks.harvard.edu/about/faculty-staff-directory/william-clark>

Professor Olivier de Weck

Co-Director, KACST-MIT Center for Complex Engineering Systems; Professor of Aeronautics and Astronautics and Engineering Systems, Massachusetts Institute of Technology

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http://esd.mit.edu/Faculty_Pages/deweck/deweck.htm

Professor Noelle Selin

Esther and Harold E. Edgerton Career Development Assistant Professor of Engineering Systems and Atmospheric Chemistry, Massachusetts Institute of Technology

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http://web.mit.edu/selin/www/about_me.html

Professor Richard de Neufville

Professor of Engineering Systems and Civil and Environmental Engineering, Massachusetts Institute of Technology

ardent@mit.edu

http://esd.mit.edu/Faculty_Pages/deneufville/deneufville.htm

Professor Kenneth Strzepek

Professor Emeritus of Civil, Environmental and Architectural Engineering, University of Colorado at Boulder; Research Scientist, Joint Program on the Science and Policy of Global Change, Massachusetts Institute of Technology

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http://globalchange.mit.edu/about/our-people/personnel/all_id/126

Mr. Stephen R. Connors

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Professor Hazhir Rahmandad

Associate Professor, Virginia Polytechnic Institute and State University

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http://www.ise.vt.edu/People/Faculty/Bios/Rahmandad_bio.html

Professor John Sterman

Director, MIT System Dynamics Group; Jay W. Forrester Professor of Management, Massachusetts Institute of Technology

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<http://jsterman.scripts.mit.edu/>

Professor Yacov Haimes

Founding Director, UVa Center for Risk Management of Engineering Systems; Lawrence Quarles Professor at the School of Engineering & Applied Sciences, University of Virginia

haimes@virginia.edu

<http://web.sys.virginia.edu/yacov-y-haimes.html>

Professor Joost Santos

Assistant Professor of Engineering Management & Systems Engineering, George Washington University

joost@gwu.edu

<http://www.seas.gwu.edu/~joost/Welcome.html>

Dr. Kenneth G. Crowther

Multi-Disciplined Systems Engineer and Risk Analyst, MITRE Corporation

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