

Junyung KIM

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EDUCATION

Rensselaer Polytechnic Institute (RPI)

Troy, NY

Ph.D. candidate of Nuclear Engineering and Science; GPA: 3.86/4.0

May. 2017 – Current

- Major Research Topic: Autonomous system control, Dynamic probabilistic risk assessment
- Academic Advisor: Dr. Kang, Hyun Gook (kangh6@rpi.edu)

Yonsei University

Seoul, Korea

Bachelor of Arts in Economics (Major: Applied statistics); GPA: 3.40/4.3 (9.0/10.0)

Mar. 2004 - Feb. 2012

EXPERIENCE

• Korea Advanced Institute of Science and Technology (KAIST)

Daejeon, Korea

Researcher

Feb. 2017 - May. 2017

- **Dynamic PRA:** Best estimate thermal hydraulic analysis of APR1400 accident scenarios for regulatory use.
- **Risk assessment of spent fuel:** Risk assessment of spent fuel transportation/storage and degradation characteristics analysis for on-site wet storage.

• Korea Nuclear International Cooperation Foundation (KONICOF)

Seoul, Korea

Senior Researcher

Oct. 2013 - Aug. 2016

- **Nuclear Education & Governance:** Participated in drafting road map and action items of national nuclear human resource development planning in the 5th Comprehensive Nuclear Energy Promotion Plan (CNEPP); Researched difference of national nuclear HRD policy between Korea and Japan; Led several nuclear regulatory governance and nonproliferation projects.
- **International Cooperation:** Participated in drafting international agreement of regional nuclear cooperation (RCA); Designed and managed new IAEA Technical Cooperation (TC) project (RAS 0068); Managed several IAEA Technical Cooperation (TC) Projects

• Quantum & Partners

Seoul, Korea

Business Analyst

Dec. 2012 - Jul. 2013

- **Data-driven Customer Relationship Management (CRM):** Created a data-driven CRM model combined with retail agency networks for major Fast Moving Consumer Goods (FMCG) company in Korea.

• Reebonz Korea (formerly Club Venit)

Seoul, Korea

Business Analyst

Mar. 2012 - Oct. 2012

- **Corporate Finance Modeling:** Responsible for developing startup financial modeling by looking at revenue growth drivers and implied financial ratios; Conducted research on the competitive landscape of the luxury goods industry.

• US Army (A Co., 524th MI BN, 501st MI Bde)

Seoul, Korea

Sergeant, KATUSA (Korea Augmentee Troops to US Army)

May. 2009 - Mar. 2011

- **Interpreter:** Interpreted for US and ROKA officers at the field operation; Key resolve, UFG, Northern Vigilance.

RESEARCH INTERESTS

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- **Safety of complex systems under dynamic operation:** autonomous decision making, advanced reactor licensing, dynamic probabilistic risk assessment, thermal-hydraulic modeling and simulation
 - **Soft computing techniques:** Artificial neural network, dynamic Bayesian network, Markov Decision Process
 - **Functional Modeling:** Multilevel flow modeling (MFM)

PROGRAMMING SKILLS

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- **Program language:** R, Python
 - **System Code:** RELAP-5, RAVEN, SHAPIRE, MOSAIQUE, AIMS-PSA

CERTIFICATION

- **CFA (Chartered Financial Analyst) Level 1 passed (Jul. 2010)**
- **CASL (The Consortium for Advanced Simulation of LWRs) Education Certification (Aug. 2018)**

PUBLICATION

• **Books:**

- Junyung Kim, Minwon Seo, Mincheol Park, Youngjune Kim, Inchul Moon, “Nuclear Education and Training Programme in Korea.” Korea Nuclear International Cooperation Foundation. 2016).

• **Journal Papers:**

- Kim, Junyung, Asad Ullah Amin Shah, and Hyun Gook Kang. "Dynamic risk assessment with Bayesian network and clustering analysis." Reliability Engineering & System Safety (2020): 106959.
- Asad Ullah Amin Shah, Robby Christian, Junyung Kim, Jaewhan Kim, Jinkyun Park, Hyun Gook Kang, "Dynamic Probabilistic Risk Assessment Based Response Surface Approach for FLEX and Accident Tolerant Fuels for Medium Break LOCA Spectrum." Energies 14.9 (2021): 1-25.

• **Conference Papers (Full Papers)**

- Junyung Kim, Hyun Gook Kang. “Physics-informed machine learning aided system space discretization.” Proceedings of 12th Nuclear Plant Instrumentation, Control and Human-Machine Interface Technologies (NPIC&HMIT 2021), 2021.
- Junyung Kim, Hyun Gook Kang. “Quantitative Reasoning and Risk Assessment with Dynamic Bayesian Network.” Proceedings of 2020 American Nuclear Society (ANS) Virtual Winter Meeting, 2020.
- Shah, Asad Ullah Amin, Robby Christian, Junyung Kim, Hyun Gook Kang. "Coping Time Analysis for Chromium coated Zircaloy for Station Blackout Scenario based on Dynamic Risk Assessment." Proceedings of The 15th Probabilistic Safety Assessment and Management Conference (PSAM 15), Venice, Italy. 2020.
- Junyung Kim, Hyun Gook KANG. “Pattern Identification of Dynamic Event Tree Scenarios with Clustering.” Probabilistic Safety Assessment and Management (PSAM 14), Los Angeles, CA, September 2018.
- Jeon, In Seop, Junyung Kim, Robby Christian, Hyun Gook KANG. “Mitigation coverage evaluation of passive systems based on causality estimation using Multilevel Flow Model.” Probabilistic Safety Assessment and Management (PSAM 14), Los Angeles, CA, September 2018.
- Junyung Kim, Mincheol Park, Youngjune Kim, Incheol Moon. “Comparative Study of National Nuclear HRD Policy between Korea and Japan.” Spring Meeting of the Korea Nuclear Society (KNS 2016), Jeju, Korea, May, 2016.

• **Conference Papers (Summaries or Abstracts):**

- Junyung Kim, Hyun Gook Kang. “Risk Assessment using Multilevel Flow Modeling with dynamic Bayesian Network.” Proceedings of the Fifth International Workshop on Functional Modelling for Design and Operation of Engineering Systems (IWFM 2020), 2020.
- Kyle Warns, Junyung Kim, Asad Ullah Amin Shah, Hyun Gook Kang. “Inference Rule Generation using Multilevel Flow Modeling for Fuzzy Logic-based System Control.” Proceedings of the Fifth International Workshop on Functional Modelling for Design and Operation of Engineering Systems (IWFM 2020), 2020.
- Junyung Kim. “Introduction to Nuclear HRD in the Republic of Korea.” 2016 International Youth Nuclear Conference (IYNC), Hangzhou, China, July, 2016.

AWARDS AND HONORS

- **2016:** Best Employee Award, Korea Nuclear International Cooperation Foundation
- **2011:** Army Achievement Medal, U.S. Army
- **2004:** Recipient of academic excellence scholarship: 2 semesters

LANGUAGE

- **Korean:** Native
- **English:** Proficient
- **Chinese:** Beginner

RESEARCH PROJECTS PARTICIPATION

- **On-going Projects:**

- Coping time and cost analysis of accident tolerant plant design based on dynamic PRA methodology, Department of Energy, U.S.A, 2018.10.1 ~ 2021.09.30 (800,000 USD)
- Design of risk-informed autonomous operation for advanced reactor, Department of Energy, U.S.A, 2019.10.1 ~ 2022.09.30 (1,000,000 USD)

- **Completed Projects:**

- Best estimate thermal hydraulic analysis of APR1400 accident scenarios for regulatory use, National Research Fund, Republic of Korea, 2017.2.1 ~ 2017.5.12 (100,000,000 KRW)
- Risk assessment of spent fuel transportation/storage and degradation characteristics analysis for on-site wet storage, National Research Fund, Republic of Korea, 2017.2.1 ~ 2017.5.12 (100,000,000 KRW)
- The establishment of an efficient support system that cultivates highly qualified professionals in nuclear energy, National Research Fund, Republic of Korea, 2015.9.15 ~ 2016.8.31 (580,000,000 KRW)
- Enhancing the comprehensive management system of national capacity building for nuclear manpower, National Research Fund, Republic of Korea, 2015.9.15 ~ 2016.8.31 (350,000,000 KRW)
- Development of Radiation Detection System for Imported Cargos, Korea Institute of Nuclear Safety, Republic of Korea, 2015.6.15 ~ 2015.12.14 (100,000,000 KRW)
- The enhancement of the integrated management system for public acceptance of nuclear energy, National Research Fund, Republic of Korea, 2015.7.1 ~ 2015.11.30 (350,000,000 KRW)
- Implementing the Global Internship Program for Next Generation of Nuclear Professional Manpower, National Research Fund, Republic of Korea, 2015.7.1 ~ 2015.11.30 (200,000,000 KRW)
- Management of the Efficient Support System for Capacity Building of Human Resources in Nuclear Energy, National Research Fund, Republic of Korea, 2015.7.1 ~ 2015.11.30 (350,000,000 KRW)
- A study on establishing advanced nuclear international cooperation system, National Research Fund, Republic of Korea, 2013.10.20 ~ 2015.6.30 (2,300,000,000 KRW)