



# Curriculum Vitae

**Jiwon Choe**

T. +82-52-217-3006 / F. +82-52-217-2429 / chi91023@unist.ac.kr

---

## **AFFILIATION**

5<sup>th</sup> semester in the Doctoral Program  
Ulsan National Institute of Science & Technology (UNIST)  
UNIST-gil 50, Ulsan Metropolitan City, Republic of Korea, 44919

## **EDUCATION**

Master

- Major: Nuclear Engineering
- UNIST, Ulsan, Korea, 2013.9~2015.8

Bachelor of Engineering

- Major: Mechanical System Design and Manufacturing
- Major: Nuclear Science and Engineering
- UNIST, Ulsan, Korea, 2010.3~2013.8

## **WORK EXPERIENCE**

- Methodology Development and Programming
  - 2-step method for PWR core design
  - Acceleration of calculation speed by CPM
- Design study of Small Modular Fast Reactor
  - Boron-free small modular pressurized water reactor
  - Development of design requirements for SMR
  - Long life small modular sodium cooled fast reactor (SMSFR)
- Design study of Pressurized Water Reactor
  - Hybrid burnable absorber
  - Low-boron operation core design
  - Core economic analysis
- Load follow operation method development
  - Load follow simulation module development
  - Implement of mode-K load follow method
- Internships
  - Nuclear Engineering Division, ANL (July, 2014)
  - Sodium-cooled Fast Reactor Development Agency, KAERI (July, 2012)
- Experience
  - Session chair, PBNC2016 (April, 2016)
  - Session chair, ICAPP 2015 (May, 2015)

## **RESEARCH INTERESTS**

- Development of 2-step method approach for PWR core design
- Small modular reactor design

- Sodium-cooled Fast Reactor design
- Development design requirement for SMR
- Development low-boron operating PWR
- Load follow operation method development

## CERTIFICATES

- Awards & Scholarship
  - KNS Curie Student Award (October, 2016)
  - Best Poster Prize of PBNC2016 (Beijing, China, April, 2016)
  - Prize of Excellent Research: Interdisciplinary Project for Graduation in UNIST (June, 2013)
  - Nuclear Technology Undergraduate Student Society Scholarship, National Research Foundation of Korea (June, 2012 – February, 2013)
- Training (International)
  - POSTECH Experiments (KUCA, Japan, December, 2016)
  - CASMO-SIMULATE training (Stodsvik, MA, USA, May, 2015)
  - RELAP5/SCDAP training (West Yellowstone, MT, USA, May, 2015)
  - MIT short program: Nuclear Plant Safety (MA, USA, June, 2014)
  - Korea-Japan Joint Summer School (KURRI, Japan, August, 2012)
- Training (Domestic)
  - High Accuracy & Multi-Physics Nuclear Power Plant Design (Daejeon, August, 2016)
  - Training for nuclear plant system using PC based simulator (Daejeon, August, 2016)
  - Advanced Visual MCNP6 Workshop (Daejeon, November, 2015)
  - Reactor core design: theory and practice, KAERI (Daejeon, July, 2015)
  - Training on Criticality Analysis of Spent Nuclear Fuel (Daejeon, June, 2015)
  - McCARD developers' training (Seoul, March, 2015)
  - Simulink for System and Algorithm Modeling, MathWorks training services (Seoul, September, 2014)
  - Basic theory and programming practice of nuclear reactor design and analysis with Monte Carlo method (INTEC, January, 2014)
  - McCARD user training course, Seoul National University (SNU, August, 2013)
  - Linux System / Network Programming, Samsung SDS (Seoul, August, 2013)
  - Symbolic Computing Package for Mathematica, Dahan Tech. Inc. (Seoul, July, 2013)
  - MATLAB Parallel Computing Seminar, MathWorks training services, (UNIST, July, 2013)
  - MATLAB Based Optimization Techniques, MathWorks training services (Seoul, July, 2013)
  - Interfacing MATLAB with C Code, MathWorks training services (Seoul, April, 2013)
  - Whole core transport analysis seminar, KAERI (Muju, March, 2013)
  - High Performance Computing Winter School, KISTI (UNIST, February, 2013)
  - Education reactor AGN-201K (10W) Experiment, Kyunghee University (KHU, August, 2012)
- Membership
  - Korean Nuclear Society Student Member (November, 2012 – )

**PUBLICATIONS**  
**SCI Journal**

1. **Jiwon Choe**, Deokjung Lee, and Ho Cheol Shin, "Boron-Free Small Modular Pressurized Water Reactor Design with New Burnable Absorber," *Int. J. Energ. Res.*, 40 (15): 2128–2135. <http://dx.doi.org/10.1002/er.3590> (2016)
2. **Jiwon Choe**, Deokjung Lee, Jieun Jeong, and Ho Cheol Shin, "Performance evaluation of Zircaloy reflector for pressurized water reactors," *Int. J. Energ. Res.*, 40 (2): 160-167. <http://dx.doi.org/10.1002/er.3443> (2016)
3. **Jiwon Choe**, Deokjung Lee, Ho Cheol Shin, "New Burnable Absorber for Long-Cycle Low Boron Operation of PWRs," *Annals of Nuclear Energy*, 88: 272-279. <http://dx.doi.org/10.1016/j.anucene.2015.11.011> (2016)
4. Farrokh Khoshahval, Seongpil Yum, Peng Zhang, **Jiwon Choe**, Ho Cheol Shin, Deokjung Lee, "Smart Sensing of the Axial Power and Offset in NPPs Using GMDH Method", *IEEE Transactions on Nuclear Science*, Accepted (2017)
5. Farrokh Khoshahval, Seongpil Yum, Peng Zhang, **Jiwon Choe**, Ho Cheol Shin, Deokjung Lee, "Smart Sensing of the Axial Power and Offset in NPPs Using GMDH Method", *IEEE Transactions on Nuclear Science*, Under review (2017)
6. Eun Jeong, **Jiwon Choe**, Peng Zhang, Ho Cheol Shin, Deokjung Lee\*, "New High Performance Light Water Reactor Core Concept with Mixed Cycle Length Operation", *Int. J. Energ. Res.*, Published Online. <http://dx.doi.org/10.1002/er.3738> (2017)
7. Jinsu Park, Taewoo Tak, T.K. Kim, **Jiwon Choe**, Yongjin Jeong and Deokjung Lee, "Design Study of Long-Life Small Modular Sodium-Cooled Fast Reactor," *Int. J. Energ. Res.*, 41 (1):13-148, <http://dx.doi.org/10.1002/er.3609> (2016)
8. Taewoo Tak, **Jiwon Choe**, Yongjin Jeong, Deokjung Lee, T.K. Kim, Ser Gi Hong, "Feasibility study on ultralong-cycle operation and material performance for compact liquid metal-cooled fast reactors: A review work," *Int. J. Energ. Res.*, 39 (14): 1859-1878. <http://dx.doi.org/10.1002/er.3384> (2015)

**International Topical**  
**Meetings**

1. **Jiwon Choe**, Sooyoung Choi, Minyong Park, Peng Zhang, Ho Cheol Shin, Hwan Soo Lee, Deokjung Lee, "Validation of the UNIST STREAM/RAST-K Code System with OPR - 1000 Multi-cycle Operation," *RPHA17*, submitted, Chengdu, China, August 24-25 (2017)
2. **Jiwon Choe**, Ho Cheol Shin, Ji-Eun Jeong and Deokjung Lee\*, "Cutback Sensitivity Test for Boron-Free Small Modular PWR," *NEFES 2016*, Beijing, China, August 19-22 (2016)
3. **Jiwon Choe**, Ho Cheol Shin, Deokjung Lee\*, "Optimal Control Rod for Boron-Free Small Modular PWR," *PBNC 2016*, Beijing, China, April 5-9 (2016)
4. **Jiwon Choe**, Deokjung Lee, and Ho Cheol Shin, "Preliminary Design of Boron-Free Small Modular Pressurized Water Reactor," *PHYSOR2016*, Sun Valley, ID, USA, May 1-5 (2016)
5. **Jiwon Choe**, Chidong Kong, Sooyoung Choi, Minyong Park, Deokjung Lee, and Ho Cheol Shin, "Preliminary Analysis of New Secondary Shutdown System of Small Modular Pressurized Water Reactor," *RPHA15*, Jeju, Korea, September 16-18 (2015)
6. **Jiwon Choe**, Taewoo Tak, Yongjin Jeong, Deokjung Lee, and Taek Kyum Kim, "The Impact Of Thorium Blanket On Long-Life Fast Reactor Core Performance Characteristics," *ANUP 2014*, Jeju Island, Korea, November 9-12 (2014)
7. **Jiwon Choe**, Minyong Park, Sooyoung Choi, Taewoo Tak, and Deokjung Lee, "Upgrade of Mode-K Strategy for Daily Load-Follow Operation of OPR1000," *ISSNP 2013*, Beijing, November 22-24 (2013)

8. **Jiwon Choe**, Kyeongju Lee, and Deokjung Lee, “Feasibility Study of Load Follow Operation for OPR1000,” *Proc. ICAPP 2013*, Jeju Island, Korea, April 14-18 (2013)
9. Khang Nguyen, **Jiwon Choe**, Sooyoung Choi, Hyunsuk Lee, Wonkyeong Kim, Deokjung Lee, Matthieu Lemaire, “Verification of STREAM and MCS against OPR FA depletion calculation,” RPHA17, Chengdu, Sichuan, China, August 24-25 (2017)
10. Chidong Kong, Hyunsuk Lee, Matthieu Lemaire, Wonkyeong Kim, Yunki Jo, Jinsu Park, **Jiwon Choe**, Bamidele Ebiwonjumi, Deokjung Lee, “Introduction to UNIST Spent Nuclear Fuel Transportation Package Analysis Code System,” RPHA17, Chengdu, Sichuan, China, August 24-25 (2017)
11. Tung Dong Cao Nguyen, Hyunsuk Lee, **Jiwon Choe**, Ho Cheol Shin, Hwan Soo Lee, Deokjung Lee, “LPPT Analysis of APR1400 Reactor Core by UNIST Monte Carlo Code MCS,” RPHA17, Chengdu, Sichuan, China, August 24-25 (2017)
12. Yum Seongpil, Ho Cheol Shin, **Jiwon Choe**, Peng Zhang, Farrokh Khoshahval, Deokjung Lee, “Application of GMDH to Cross Section Functionalization,” RPHA17, Chengdu, Sichuan, China, August 24-25 (2017)
13. Jaerim Jang, **Jiwon Choe**, Sooyoung Choi, Hyunsuk Lee, Bamidele Ebiwonjumi, Ho Cheol Shin, Deokjung Lee, “Boron-free SMPWR Analysis with MCS and STREAM codes,” RPHA17, Chengdu, Sichuan, China, August 24-25 (2017)
14. Jinsu Park, Minyong Park, **Jiwon Choe**, Peng Zhang, Jaerim Jang, Deokjung Lee, “Development Status of Dynamic Reactor Nodal Computational Code RAST-K v2.0,” RPHA17, Chengdu, Sichuan, China, August 24-25 (2017)
15. Sooyoung Choi, **Jiwon Choe**, Jaerim Jang, Deokjung Lee, “Extension of PSM for Ring-type Burnable Absorber Containing Resonant Nuclides,” RPHA17, Chengdu, Sichuan, China, August 24-25 (2017)
16. Hochul Lee, **Jiwon Choe**, Deokjung Lee, Ho Cheol Shin, Hyun Chul Lee, “Verification of SMPWR According to Heavy Reflector Material: Stainless Steel, Zircaloy Using the McCARD,” RPHA17, Chengdu, Sichuan, China, August 24-25 (2017)
17. Jinsu Park, Taewoo Tak, **Jiwon Choe**, Yongjin Jeong, Deokjung Lee\*, and T. K. Kim, “Long-Life Small Modular Sodium-Cooled Fast Reactor Core Design with Breed-and-Burn Strategy,” *PHYSOR2016*, Sun Valley, ID, USA, May 1-5 (2016)
18. Taewoo Tak, **Jiwon Choe**, Yongjin Jeong, Jinsu Park, Deokjung Lee\*, and T. K. Kim, “Power Flattening Study of Ultra-Long Cycle Fast Reactor Core,” *Thorium Energy Conference 2015 (TheC15)*, Mumbai, India, October 19-22 (2015)
19. Jinsu Park, Taewoo Tak, **Jiwon Choe**, Yongjin Jeong, Deokjung Lee\*, and T. K. Kim, “Comparison of Predicted Breed-and-Burn Evaluation of a Small Modular Sodium-Cooled Fast Reactor with Several Code Systems,” *RPHA15*, Jeju, Korea, September 16-18 (2015)
20. Taewoo Tak, **Jiwon Choe**, Yongjin Jeong, Deokjung Lee\*, and T. K. Kim, “Study for Requirement of Advanced Long Life Small Modular Fast Reactor,” *iNuSTEC2015*, Nilai, Malaysia, August 17-19 (2015)
21. Ho Cheol Shin, **Jiwon Choe**, Chidong Kong, and Deokjung Lee\*, “New Burnable Absorber Design with  $^{157}\text{Gd}$  and  $^{167}\text{Er}$  for PWRs,” *ICAPP 2015*, Nice, France, May 03-06 (2015)
22. Taewoo Tak, **Jiwon Choe**, and Deokjung Lee, “Power Flattening and Breeding

Performance Study for UCFR Loading Thorium Fuel,” *PBNC2014*, Vancouver, Canada, August 24-29 (2014)

### International and Domestic Conferences

1. **Jiwon Choe**, Ho Cheol Shin and Deokjung Lee, “Cycle Length Extension of SMPWR Using Zircaloy Reflector,” *37<sup>th</sup> Annual Conference of the Canadian Nuclear Society*, Niagara Falls, ON, Canada, June 4-7 (2017)
2. **Jiwon Choe**, Deokjung Lee, Ji-Eun Jeong, Youqi Zheng, Taewoo Tak, and Ho Cheol Shin, “Axial Region Optimization for Cycle Length Extension of Small Modular PWR,” *2016 KNS Spring Meeting*, Jeju Island, Korea, May 12-13 (2016)
3. **Jiwon Choe**, Deokjung Lee, and Ho Cheol Shin, “Performance Evaluation of Alternative Reflector Materials for PWRs,” *2015 ANS Annual Meeting*, San Antonio, TX, June 7-11 (2015)
4. **Jiwon Choe**, Deokjung Lee, and Ho Cheol Shin, “New Ring Type Burnable Absorber for PWRs,” *2015 ANS Annual Meeting*, San Antonio, TX, June 7-11 (2015)
5. **Jiwon Choe**, Deokjung Lee, Ho Cheol Shin, “Improvement of PWR performance with Reflector,” *2015 KNS Spring Meeting*, Jeju Island, Korea, May 7-8 (2015)
6. **Jiwon Choe**, Chidong Kong, Deokjung Lee, and Ho Cheol Shin, “Burnable Absorbers with Enriched Er-167 in PWR Fuel Assembly,” *KNS Fall Meeting*, Pyeongchang, Korea, October 30-31 (2014)
7. **Jiwon Choe**, Minyong Park, Sooyoung Choi, Taewoo Tak, and Deokjung Lee, “Application of Mode-K Strategy to Daily Load-Follow Operation of OPR1000,” *Transactions of the American Nuclear Society Winter meeting*, Washington D.C., November 10-14 (2013)
8. Tung Dong Cao Nguyen, **Jiwon Choe**, Deokjung Lee, “Assessment of Material Homogenization for Fast Reactor Design Using MCS and MC<sup>2</sup>/TWODANT/REBUS,” *KNS Fall Meeting*, Gyeongju, Korea, October 25-27 (2017)
9. Farrokh Khoshahval, Minyong Park, Jinsu Park, **Jiwon Choe**, Peng Zhang, Ho Cheol Shin Shin, Ji Eun Jung, Hwan Soo Lee and Deokjung Lee, “Self Powered Neutron Detectors Calculations Using RAST-K 2.1,” *37<sup>th</sup> Annual Conference of the Canadian Nuclear Society*, Niagara Falls, ON, Canada, June 4-7 (2017)
10. Eun Jeong, **Jiwon Choe**, and Deokjung Lee, Ho Cheol Shin, “Impact of Erbia in Long Cycle Operation of PWR,” *KNS Fall Meeting*, Gyeongju, Korea, October 26-28 (2016)
11. Minyong Park, Deokjung Lee, **Jiwon Choe**, and Peng Zhang, Hocheol Shin and Eunki Lee, Youqi Zheng, “Development Status of Diffusion Code RAST-K 2.0 at UNIST,” *KNS Fall Meeting*, Gyeongju, Korea, October 26-28 (2016)
12. Seongpil Yum, Jaemin Kim, Minyong Park, **Jiwon Choe**, Peng Zhang, and Deokjung Lee, Ho Cheol Shin, “Accuracy Improvement of Axial Power Shape Reconstruction Using GMDH Algorithm,” *KNS Fall Meeting*, Gyeongju, Korea, October 26-28 (2016)
13. Sooyoung Choi, **Jiwon Choe**, and Deokjung Lee, “Incorporation of Collision Probability Method in STREAM to Consider Non-uniform Material Composition in Fuel Subregions,” *KNS Fall Meeting*, Gyeongju, Korea, October 26-28 (2016)
14. Ho Cheol Shin, Eun Jeong, **Jiwon Choe**, and Deokjung Lee, “Impact of UO<sub>2</sub> Enrichment of Fuel Zoning Rods in Long Cycle Operation of PWR” *KNS Fall Meeting*, Gyeongju,

- Korea, October 26-28 (2016)
15. Taewoo Tak, Jinsu Park, **Jiwon Choe**, and Deokjung Lee, Thomas. H. Fanning, Tyler Sumner, Guanheng Zhang, and T. K. Kim, “Anticipated Transient without Scram Assessment at EOC of SM-SFR Using SAS4A/SASSYS-1,” *KNS Fall Meeting*, Gyeongju, Korea, October 26-28 (2016)
  16. Sooyoung Choi, Minyong Park, Youqi Zheng, Chidong Kong, **Jiwon Choe**, Hanjoo Kim, Kiho Kim, Ho Cheol Shin, and Deokjung Lee\*, “Development Status of Reactor Physics Code Suite in UNIST,” *Croatian Nuclear Society*, Zadar, Croatia, June 5-8 (2016)
  17. Taewoo Tak, **Jiwon Choe**, Yongjin Jeong, Deokjung Lee and T. K. Kim, Preliminary Study for Conceptual Design of Advanced Long Life Small Modular Fast Reactor, *KNS Spring Meeting*, Jeju, Korea, May 6-8 (2015)
  18. Chidong Kong, **Jiwon Choe**, Deokjung Lee and Ho Cheol Shin, Isotope Separation Effect of Burnable Absorber for Long-cycle Boron-free Reactor Core, *KNS Spring Meeting*, Jeju, Korea, May 6-8 (2015)
  19. Chidong Kong, **Jiwon Choe**, Ho Cheol Shin, and Deokjung Lee, “Impact of Isotope Separation on Burnable Absorber Performance,” *2015 ANS Annual Meeting*, San Antonio, TX, June 7-11 (2015)
  20. Minyong Park, **Jiwon Choe**, Deokjung Lee, and Eunki Lee, “Application of RAST-K to Simulation of OPR1000 Daily Load Follow Operation,” *KNS Fall Meeting*, Pyeongchang, Korea, October 30-31 (2014)
  21. Hyeon-Jun Jeong, **Jiwon Choe**, and Deokjung Lee, “VENUS-2 Benchmark Problem Analysis with HELIOS-1.9,” *KNS Fall Meeting*, Pyeongchang, Korea, October 30-31 (2014)
  22. Taewoo Tak, Chidong Kong, **Jiwon Choe**, and Deokjung Lee, “Reflector Performance Study in Ultra-long Cycle Fast Reactor,” *KNS Fall Meeting*, Kyeongju, October 24-25 (2013)
  23. Taewoo Tak, **Jiwon Choe**, Hyunsuk Lee and Deokjung Lee, “Verification of UCFR-100 Depletion Calculation with Deterministic Method by Comparing with Probabilistic Method,” *Transactions of the American Nuclear Society Winter meeting*, Washington D.C., November 10-14 (2013)
  24. Sooyoung Choi, **Jiwon Choe**, and Deokjung Lee, “On the Fuel Escape Probability Approximation of Equivalence Theory,” *ANS Winter Meeting*, Washington D.C., November 10-14 (2013)
  25. Kyeongju Lee, **Jiwon Choe**, and Deokjung Lee, “Application of Load Follow Operation to Equilibrium Cycle of OPR1000,” *KNS Fall Meeting*, Gyeongju, Korea, October 25-26 (2012)

## PATENT

Jiwon Choe, Ji Eun Jeong, and Ho Cheol, “Neutrons Reflector for Pressurized Water Reactor,” KOR Patent: 10-2016-0167561, patent pending, December 9 (2016)