KYUTAE LEE

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EDUCATION / MILITARY SERVICE

THE UNIVERSITY OF IOWA – IOWA CITY, IA, USA Graduation Date: **DEC 2013**
Doctor of Philosophy in Hydrology, Hydraulics, and Water Resources Program

NORTH CAROLINA STATE UNIVERSITY, RALEIGH, NC, USA Graduation Date: **DEC 2007**
Master of Civil Engineering in Water Resources & Environmental Program

CHUNG ANG UNIVERSITY, SEOUL, SOUTH KOREA Graduation Date: **JAN 2005**
Bachelor of Engineering in Civil and Environmental Engineering Program

REPUBLIC OF KOREA AIRFORCE, SOUTH KOREA Discharged Date: **AUG 2001**
Administrative official (Sergeant)

APPOINTMENTS

POSTDOCTORAL RESEARCH ASSOCIATE AT OAK RIDGE NATIONAL LAB **MAR 2014 –CURRENT**
Supervisor: Brennan T. Smith

- Hydropower Asset Management Project: Hydropower flow measurement value research for low-head short converging intake, Hydropower unit and plant dispatch optimization analysis, Computer fluid dynamics modeling, and U.S. hydropower intake classification.
- The 45-Mile 3MW Hydropower Project : Small Hydropower Development on Irrigation Canals in the United States
- Standardized Modular Hydropower (SMH) Development Project: Leading a conceptual design of a full-scale test center for standard modular hydropower

POSTDOCTORAL RESEARCH ASSOCIATE AT THE UNIVERSITY OF IOWA **JAN 2014 – FEB 2014**
Advisor: Larry Weber and Marian Muste

- Experimentation on Slope-Area method in Unsteady Open Channel Flow

RESEARCH ASSISTANT AT THE UNIVERSITY OF IOWA (IIHR), USA **AUG 2008 – DEC 2013**
Advisor: Larry Weber and Marian Muste

- Dissertation topic: Evaluation of Methodologies for Continuous Monitoring of Discharges in Unsteady Open-Channel Flows (1D analytical solution development, Index-velocity method, Continuous slope-rea method, and River discharge uncertainty analysis)
- Evaluation of the potential for hysteresis in index-velocity rating curves for Chicago Sanitary and Ship Canal near Lemont, Illinois (US Geological Survey, US Army Corps Engineer, and University of Illinois Urbana Champaign)
- Flood modeling study for a large reach of the lower Iowa River corridor using 2D MIKE FLOOD and ArcGIS
- Iowa Watershed Stream Digitization using ArcGIS (Iowa Flood center and Iowa Department of Natural Resources)
- Development of practical implementation guide for uncertainty analysis in measurements
- Implementation of Uncertainty Analysis framework for conventional and ADCP discharge measurements
- Cross-section survey project for 143 Iowa Flood Center Stage Sensor locations (http://ifis.iowafloodcenter.org/ifis)
- Field and laboratory experience with RDI StreamPro ADCP, Sontek M9, Sontek FlowTracker ADV, Nortek Vectrino ADV, Topcon Total Station, Trimble GPS RTK, Pressure transducer, etc.

VISITING RESEARCHER AT INSA DE LYON UNIVERSITY, LYON, FRANCE OCT 2012 – DEC 2012

Advisor: Jean-luck Bertrand-Krajewski

- MATLAB Code development for an analytical solution of unsteady flows
- Implementation of an analytical solution to two sewer systems and open channel flow (Rhone river) in France

REASEARCH ASSISTANT AT NORTH CAROLINA STATE UNIVERSITY, USA SEP 2005 - DEC 2007

Advisor: Ranji Ranjithan and Morton Barlaz

- Development of Solid Waste Management Life Cycle Inventory Model for Construction & Demolition Waste

POST BACHELOR RESEARCH ASSISTANT AT CHUNG ANG UNIVERSITY, KOREA JAN 2005 - JULY 2005

Advisor: Jeil Oh

- The contaminant identification in saltwater and marine deposits during harbor construction in Korea
- Development of a new technology for the treatment of non-point source runoff in bridge using activated carbon
- Wastewater sludge disposal alternatives

JOURNAL PUBLICATIONS

[1] Muste, M., **Lee, K**. and Bertrand-Krajewski, J.-L.**, 2012**, Standardized uncertainty analysis for hydrometry: a review of relevant approaches and implementation examples. *Hydrological Sciences Journal*, 57 (4), 643–667. (Corresponding author)

[2] Muste, M. and **Lee, K.**, **2013**, Discussion of "Uncertainty Model for In Situ Quality Control of Stationary ADCP Open-Channel Discharge Measurement" by Hening Huang. *Journal of Hydraulic Engineering* 139:1, pages 102-104. (Corresponding author, J.C. Stevens Award)

[3] **Lee, K.**, Ho, H-C., Muste, M. and Wu, C-H., **2014**, Uncertainty in Open Channel Discharge Measurements Acquired with StreamPro ADCP. *Journal of Hydrology*, 509, 101-114.

[4] **Lee, K.** and Muste, M., **2016**, Technical Note: Refinement of Fread's Method for improved tracking of stream discharges during unsteady flows, *Journal of Hydraulic Engineering*, accepted.

[5] M. Muste, Z. Cheng, **K. Lee**, J. Hulme and P. Vidmar, **2016,** Uncertainty considerations on the index-velocity method in steady and unsteady flows, Water Resources Research, in review.

[6] **Lee, K**., Firoozfar, A. R., and Muste, M., **2016**, Technical Note: Monitoring of unsteady open channel flows using continuous slope-area method, Hydrol. Earth Syst. Sci. Discuss., doi:10.5194/hess-2016-289, in review.

CONFERENCE AND TECHNICAL REPORTS

[1] **Lee, K., 2010**, Flood modeling study for the simulation of a large reach of the lower Iowa River corridor using MIKE software. KSEA Midwest Regional Conference, University of Iowa, Iowa City, USA

[2] **Lee, K.** and Muste, M., **2011**, Comparison of standardized approaches for conduct of uncertainty analysis. Proceedings of the ASCE Annual Civil engineering Conference Memphis, Tennessee, USA

[3] Muste, M. and **Lee, K.**, **2011**, Development of the decision-aid tool, Phase I: Review of available Decision-aid Tools for Implementation of Uncertainty Analysis. Geneva, Switzerland: World Meteorological Organization.

[4] Muste, M. and **Lee, K., 2012**, Development of the decision-aid tool, Phase II: Development of examples for UADAT implementation. Geneva, Switzerland: World Meteorological Organization.

[5] Muste, M., Ho, H-C. and **Lee, K.**, **2012**, A Note on the Role of Conceptual Bias on the Uncertainty of Flow Rating Curves. Hydraulic Measurements & Experimental Methods conference, Snowbird, Utah, USA

[6] **Lee, K., 2013**, Hysteresis-induced Uncertainty in Stage-Discharge Rating Curves, Chateaubriand Fellowship Report, Embassy of France, USA.

[7] Muste, M. and **Lee, K.**, **2013**, Quantification of Hysteretic Behavior in Stream Flow Rating Curves. Proceeding of 2013 IAHR World Congress, Chengdu, China.

[8] Muste, M. and **Lee, K.**, **2013**, Hysteresis in Index-Velocity Rating Curves, Grant Report G13AP0008, U.S. Army Corps of Engineers, Chicago District, Chicago, Illinois.
[9] Christian, M., **Lee, K.** and Smith, B., **2014**, Hydropower Flow Measurement in the United States, DOE ORNL/TM report, Oak Ridge National Lab, Tennessee.
[10] **Lee, K.**, Christian, M.. and Smith, B., **2015,** Development and application of a standardized flow measurement uncertainty analysis framework to various low-head short-converging intake types across the United States federal hydropower fleet, Proceeding of HydroVision Conference, Portland, Oregon.
[11] Christian, M., **Lee, K.**, Smith, B. and Hadjerioua, B., **2015**, Impact of the number of applied current meter sensors on the accuracy of flow rate measurements across a range of hydroelectric facilities indicative of the domestic hydroelectric fleet, Proceeding of HydroVision Conference, Portland, Oregon.
[12] Smith, B., Witt, A., Stewart, K., **Lee, K**., DeNeale, S., Bevelhimer, M., Burress, T., Pracheil, B., Pries, J., O'Connor, P., Hetrick, S., Ekici, K., Papanicolaou, T., Tsakiris, A., Kutz, B., Bishop, N., McKeown, A., Welch, T. and Rabon, D., **2016**, A Multi-Year Plan for Research, Development, and Prototype Testing of Standard Modular Hydropower Technology, ORNL/TM-2016/102, Oak Ridge National Lab, Tennessee (in press).
[13] **Lee, K**., Signore, S., Wolff, P., March, P. and Smith, B., **2016**, Operational Gap and Correlation Analysis Report for USBR Flaming George and CCPUD Rocky Reach Hydro Plants, ORNL/TM-2016/125, Oak Ridge National Lab, Tennessee (in press).
[14] Hadjerioua, B., Christian, M., **Lee, K**., Fleischer, N. and Mauer, E., **2016**, Small Hydropower Development on Irrigation Canals in the United States: The 45-Mile Hydropower Project 3MW Project Performance and Lessons Learned- Full Story, Proceeding of HydroVision Conference, Minneapolis, MN.
[15] **Lee, K**., Smith, B., Bishop, N., Welch, T. and Rabon, D., **2016**, Conceptual Development of a Full-Scale Hydraulic Test Facility for Standardized and Modular Hydropower Technology, Proceeding of HydroVision Conference, Minneapolis, MN.

PRESENTATIONS

[1] **Lee, K.,** Ranjithan, R. and Barlaz, M., **2006**, Solid waste management-Life-Cycle Inventory Model for Construction & Demolition Waste, Spring Symposium Poster presentation, North Carolina State University, NC.
[2] **Lee, K.** and others., **2010**, Inundation maps for Iowa as a group presentation, Legislative Meeting jointly with the UI Center for Global and Regional Environmental Research (CGRER), the State Capitol in Des Moines, Iowa.
[3] **Lee, K., 2010**, Flood Risk Management, IIHR seminar, University of Iowa, Iowa City.
[4] **Lee, K.** and Muste, M., **2012**, Exploration of Hysteresis effects in Small Streams, IIHR seminar, University of Iowa, Iowa City.
[5] Muste, M. and **Lee, K.**, **2013**, Hysteresis in River Discharge Rating Curves, US Geological Survey, Urbana Champaign, Illinois.
[6] **Lee, K.**, Muste, M., Ho, H-C. and Wu, C-H., **2013**, Hysteresis-induced Uncertainty in Stage-Discharge Rating Curves, US Geological Survey, Iowa City.
[7] **Lee, K.**, **2013**, Analysis of Slope-Area Method for potential Implementation for Iowa Flood Center Stage Network, Iowa Flood Center, Iowa City.
[8] Muste, M. and **Lee, K.**, **2013**, Hysteresis in Discharge Rating Curves, Madrid, Spain.
[9] **Lee, K.**, Christian, M., and Smith, B., **2015,** Development and application of a standardized flow measurement uncertainty analysis framework to various low-head short-converging intake types across the United States federal hydropower fleet, Postdoc Symposium, Oak Ridge National Lab, Oak Ridge, Tennessee, USA.
[10] Christian, M., **Lee, K.**, Smith, B. and Hadjerioua, B., **2015**, Impact of the number of applied current meter sensors on the accuracy of flow rate measurements across a range of hydroelectric facilities indicative of the domestic hydroelectric fleet, Postdoc Symposium, Oak Ridge National Lab, Oak Ridge, Tennessee, USA.
[11] **Lee, K.**, Christian, M.. and Smith, B., **2015,** Development and application of a standardized flow measurement uncertainty analysis framework to various low-head short-converging intake types across the United States federal hydropower fleet, HydroVision Conference, Portland, Oregon.

[12] Christian, M., **Lee, K.**, Smith, B. and Boualem Hadjerioua, **2015**, Impact of the number of applied current meter sensors on the accuracy of flow rate measurements across a range of hydroelectric facilities indicative of the domestic hydroelectric fleet, HydroVision Conference, Portland, Oregon.
[13] **Lee, K**., **2016**, Testing and Validation Capability Research Development, Standard Modular Hydropower Workshops, ORNL, Oak Ridge, Tennessee.

PROFESSIONAL SOCIETY MEMBERSHIP

- International Association for Hydraulic Research (IAHR), Member
- Korean-American Scientists and Engineers Association (KSEA), Member

HONORS AND AWARDS

- First Place for 2015 Technical Papers of the Year in Water Management & Movement, HydroVision conference, 2015
- J.C.Stevens Award for Outstanding Paper, American Society of Civil Engineers, 2014
- Chateaubriand Fellowship, Embassy of France in USA, 2012
- Graduate Fellowship for short-term study in UK and Netherlands, 2010
- Giaquinta Scholarship, University of Iowa, 2008
- Merit-Based Scholarship, Chung-Ang University, 2002
- Scholarship for Voluntary Service, Chung-Ang University, 1998

TEACHING EXPERIENCE

TEACHING ASSISTANT AT THE UNIVERSITY OF IOWA, USA

"Principles of Hydraulics and Hydrology" by George Constantinescu	**JAN 2009 – MAY 2009**
"Experimental Methods in Fluid Mechanics and Heat Transfer" by Marian Muste	**JUNE 2012 – JULY 2012**
"Principles of Hydraulics and Hydrology" by Allen Bradley	**JAN 2013 – MAY 2013**
"Experimental Methods in Fluid Mechanics and Heat Transfer" by Marian Muste	**JUNE 2013 – JULY 2013**
"Engineering Problem Solving I" by Allen Bradley	**AUG 2013 – DEC2013**

COMPUTING SKILLS

- Programming Languages: MATLAB, R, Java, FORTRAN, Visual Basic, and Html.
- Application Software: Star CCM+, ArcGIS, Tecplot 360, Origin, MIKE (21/11/Flood), HEC (HMS/RAS), Fluent, FlowLab, AutoCAD, WaterCAD, EPA Net, SAS, Blue-J, and Microsoft-office

LICENSES AND ACTIVITIES

LICENSES

- The Certificate of Successful Completion of Flood Modeling for Management Course, UNESCO-IHE Institute, 2009, Netherland
- The license for Civil, Environmental and Water Resources engineer (F.E), 2004, Korea

ACTIVITIES

- President of Korean Students Scholars & Students Association (KSSA), The University of Iowa, 2009-2013, USA
- Spring Symposium organizer in North Carolina State University, 2007, USA
- General Manager of North Carolina State University Korean Students Association, 2007, USA

- The Winner of Annual Miniature Bridge building Competition in Chung Ang University, 2002, Korea
- President of Korea's Traditional Music Instrument Club in Chung Ang University, 1998, Korea

References available upon request.