Seongeun Choi

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Skills

OpenFOAM

TensorFlow

AutoCAD

MATLAB

C/C++

Python

RESEARCH INTEREST

Turbulent flow; Deep learning; Stratified flow; Anaerobic digesters; Lagrangian Coherent Structure

EDUCATION

Seoul National University, Civil and Environmental engineering

Completion of PhD

Sep 2017 – Aug 2020

* Relevant Coursework

- ✓ Parallel Scientific Computation
- ✓ Computational Fluid Mechanics
- ✓ Advanced Scientific Computation
- ✓ Numerical Analysis
- ✓ Sediment Transport
- ✓ Turbulent Flows
- ✓ Fluid Dynamics
- ✓ Coastal Environmental Hydraulics
- ✓ Water Wave Mechanics
- ✓ Advanced Environmental Hydraulics

Bachelor

Mar 2012 – Aug 2017

* Relevant Coursework

- ✓ Elementary Fluid Mechanics and Lab
- ✓ Coastal and Harbor Engineering
- ✓ Digital Computer Concept and Practice
- ✓ Hydraulics and Lab
- ✓ Engineering Design and CAD

RESEARCH & EMPLOYMENT EXPERIENCE

Research Assistant

Seoul, Korea

Seoul National University – Flow Physics and Informatics Laboratory Sep 2017 – Present

- ✓ **Deep Learning**: Developed the subgrid-scale model in Large Eddy Simulation (LES) trained by Convolutional Neural Network (CNN) for saving the computational costs and better predicting the flow field
- ✓ **Stratified flow**: Studied the mixing of a stratified fluid by a bubble plume and determined the seasonal mixing efficiency based on the field observation data
- ✓ **Anaerobic digesters**: Simulated the fluid flow inside the anaerobic digester and investigated the change of the dead zone depending on various propeller positions and operating time
- ✓ **Coherent Structure:** Analyzed the hydrodynamic characteristics of a vegetated compound channel by employing the Lagrangian Coherent Structure (LCS) analysis

Teaching Assistant

Seoul, Korea

Seoul National University – Course name: Hydraulics and Lab. Mar 2018 – Present

- ✓ Measured the vertical distribution of stream-wise velocity in the open channel using Particle Image Velocimetry (PIV) and Acoustic Doppler Velocimetry (ADV)
- ✓ Observed hydraulic jump in open channel and compared the measured downstream flow depth with theoretical results estimated from the continuity and momentum equation
- ✓ Observed the flow characteristics over various kinds of weirs and estimated the discharge coefficient depending on the types of weirs

Conference Organizing Staff

Seoul, Korea

9th International Symposium on Environmental Hydraulics Jul 2021

Field Observations Yeong-ju, Korea
Yeong-ju dam, Yeong-ju Apr 2020 – Nov 2020

- ✓ Obtained high-resolution observed data continuously along the lateral line by utilizing the Yoing Ocean Data Acquisition Profiler (YODA Profiler) and measured the vertical temperature profiles by repeatedly falling and raising the Conductivity-Temperature-Density (CTD) sensor

Hyeong-san River, Pohang Pohang, Korea
Apr 2019 - Present

- ✓ Conducted field observations to investigate the hydraulic characteristics of the Hyeong-san Estuary and acquired model validation data

Research Assistant (Undergraduate Intern) Seoul, Korea
Seoul National University –Climate Change Adaptation in Water Resources June 2015 – Aug 2015

- ✓ Studied Assumption-Based Planning (ABP) and Dynamic Adaptive Policy Pathways (DAPP), which are adaptive policy decisions that take uncertainties arising in the future

PUBLICATIONS

Choi, S.E. and Hwang, J.H.*,2021, Lagrangian Coherent Structure analysis on vegetated field, Submitted
Choi, S.E., Hwang, J.H. * and N.I. Won, 2021, Numerical Simulation of aeration column in stratified environments, Submitted

CONFERENCES

INTERNATIONAL POSTER AND PRESENTATION

Choi, S.E. and Hwang, J.H.*, 2021. 07, Analysis of Vegetated Compound Channel with Lagrangian Coherent Structure, 9th ISEH, Seoul, Korea
Hwang, J.H.*, Kim, D.H., Park, H.C., **Choi, S.E**., Kim, D.K., Kim, H.J. and Won, N.I., 2021. 07, Analysis of Vegetated Compound Channel with Lagrangian Coherent Structure, 9th ISEH, Seoul, Korea
Choi, S.E. and Hwang, J.H.*, 2020. 11, Three-dimensional flow of vegetated compound channel, 2020 Smart Grid International Conference, Incheon, Korea
Choi, S.E. and Hwang, J.H.*, 2019. 10, The applicability of LCS to predict pollutant trajectories, 2019 Smart Grid International Conference, Incheon, Korea
Choi, S.E. and Hwang, J.H.*, 2019. 09., Analysis with LCS on material transport around vegetation field, 38th IAHR World congress, Panama city, Panama

DOMESTIC POSTER AND PRESENTATION

Choi, S.E. and Hwang, J.H.*, 2021.06., Mixing effect of aeration in thermally stratified water, Korea Water Resources Association, Gwangju, Korea
Choi, S.E. and Hwang, J.H.*, 2020.08., Analysis with LCS on flow around vegetation field, 11th National Congress on Fluids Engineering, Jeju, Korea
Choi, S.E. and Hwang, J.H.*, 2019.05., Analysis of particle dispersion for the various Stokes number. The Korean Society for Marine Environment and Energy, Jeju, Korea.

SCHOLARSHIPS

Presidential Scholarship, Seoul National University	2019 - Present
Brain Korea 21 Plus Scholarship, National Research Foundation of Korea	2018 - Present
Scholarship for Teaching Assistant, Seoul National University	2019

AWARDS

'Certificate of Excellence Award' at 'The Society of Korean Smart Water Grid conference' in 2019