VAN-TU NGUYEN, PhD

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CFD lab, School of Mechanical Engineering,

Pusan National University, Busan 609-735, South Korea.

EDUCATION

2011-2017: Ms & PhD, School of Mechanical Engineering (SME), Pusan National University (PNU), South Korea
Thesis: "*Development of Numerical Methods for Multiphase Flows: Applications to Free-Surface Flow and Water Impact Problems*"

2005-2010: B.E, University of Engineering and Technology, Vietnam National University, Hanoi, Vietnam

EXPERIENCE

2020-Present Research Professor, SME, PNU, South Korea

2017-2020: Post-doctoral Researcher, SME, PNU, South Korea

- Charged with developing codes and computing internal and external multiphase flows with and without 6DOF objects in research projects.
- Developing and validating three and five equation models for compressible multiphase flows
- Developing and validating a sharp interface capturing method for two- and three-phase flows.
- Advanced a Navier–Stokes solver based on the improved volume-of-fluid method for complex interfacial-flow simulations.
- Developed and validated a VOF interface sharpening method for two-phase flows.
- High-performance parallel computation using OpenMP.
- Instructing assistant for students in the CFD Research lab.

2011-2017: Graduate Researcher, SME, PNU, South Korea

- Developed and validated a free surface flow solver for complex three-dimensional interfacial problems.
- Developed and validated a Navier–Stokes solver for water entry bodies with moving Chimera grid method in 6DOF motions.

2010-2011: Researcher, Institute of Mechanics, Vietnam Academy of Science and Technology, Vietnam

- Developed a semi-empirical method for flood wave prediction in rivers using the Muskingum method and Kalman filter.
- Experimented and evaluated corrosion of oil pipe based on the percentage of water in mixed water-oil products.

COMPUTING SKILLS

Programming software: FORTRAN, C, MATLAB, OpenMP and Visual Studio
Meshing software: GRIDGEN and POINTWISE
Engineering software: CAD/CAM

FUNDING and AWARD

2019 – 2020: Post-doctoral Researcher Scholarship, SME, PNU, South Korea.
2017 – 2019: BK fellowship award for a postdoctoral researcher, Brain Korea 21 Plus Program, Korea Government.
2011 – 2016: BK Scholarship for graduate students, Brain Korea 21 & 21 Plus Program, Korea Government.
2009: Third Prize in Student Researching contest, University of Engineering and Technology, VNU Hanoi.

PUBLICATIONS

Research pages:

https://www.researchgate.net/profile/Van_Nguyen21

https://scholar.google.co.kr/citations?user=sU9CmaYAAAAJ&hl=en

International Journal papers:

[**17**] Phan, T.-H., **Nguyen, V.-T.**, Duy, T.-N., Kim, D.-H., Park, W.-G., 2021a. Influence of phase-change on the collapse and rebound stages of a single spark-generated cavitation bubble. International Journal of Heat and Mass Transfer, 122270.

[**16**] Phan, T.-H**., Nguyen, V.-T.**, Duy, T.-N., Kim, D.-H., Park, W.-G., 2021b. Numerical study on simultaneous thermodynamic and hydrodynamic mechanisms of underwater explosion. International Journal of Heat and Mass Transfer 178, 121581.

[15] V.-T Nguyen, T.-H Phan, W.-G Park, Numerical modeling of multiphase compressible flows with the presence of shock waves using an interface-sharpening five-equation model, International Journal of Multiphase Flow 135, 103542, 2021

[14] V.-T. Nguyen, T.-H. Phan, T.-N. Duy, W.-G. Park, 3D simulation of water entry of an oblique cylinder with six-degree-of-freedom motions using an efficient free surface flow model, Ocean Eng, 220 (2021) 108409.

[13] V.-T. Nguyen, T.-H. Phan, T.-N. Duy, W.-G. Park, Numerical modeling for compressible two-phase flows and application to near-field underwater explosions, Comput Fluids, 215 (2021) 104805.

[12] T.-H. Phan, J.-G. Shin, **V.-T. Nguyen**, T.-N. Duy, W.-G. Park, Numerical analysis of an unsteady natural cavitating flow around an axisymmetric projectile under various free-stream temperature conditions, Int J Heat Mass Tran, 164 (2021) 120484.

[11] T.-N. Duy, **V.-T. Nguyen**, T.-H. Phan, W.-G. Park, An enhancement of coupling method for interface computations in incompressible two-phase flows, Comput Fluids, 214 (2021) 104763.

[10] V-T Nguyen, Phan T-H, Park W-G. Modeling and numerical simulation of ricochet and penetration of water entry bodies using an efficient free surface model. Int J Mech Sci. 2020;182:105726.

[9] T.-H. Phan, **V.-T. Nguyen**, W.-G. Park, Numerical study on strong nonlinear interactions between spark-generated underwater explosion bubbles and a free surface, Int J Heat Mass Tran, 163 (2020) 120506.

[8] V-T Nguyen, Nguyen NT, Phan T-H, Park W-G. Efficient three-equation two-phase model for free surface and water impact flows on a general curvilinear body-fitted grid. Comput Fluids, 2020; 104324.

[7] Phan T-H**, Nguyen V-T**, Park W-G. Numerical study on dynamics of an underwater explosion bubble based on compressible homogeneous mixture model. Comput Fluids. 2019;191:104262.

[6] V-T Nguyen, V-D Thang, W-G Park, A novel sharp interface capturing method for two- and three-phase incompressible flows, Computers & Fluids, Volume 172, 2018, Pages 147-161, ISSN 0045-7930, https://doi.org/10.1016/j.compfluid.2018.06.020.

[5] V-T Nguyen and W-G Park, Enhancement of Navier–Stokes solver based on an improved volume-of-fluid method for complex interfacial-flow simulations, Applied Ocean Research, Volume 72, 2018, Pages 92-109, ISSN 0141-1187, https://doi.org/10.1016/j.apor.2018.01.007.

[4] V-T Nguyen and W-G Park, A volume-of-fluid (VOF) interface-sharpening method for two-phase incompressible flows, Computers & Fluids, Volume 152, 2017, Pages 104-119, ISSN 0045-7930, http://dx.doi.org/10.1016/j.compfluid.2017.04.018.

[3] V-T Nguyen, D-T Vu, W-G Park, C-M Jung, Navier–Stokes solver for water entry bodies with moving Chimera grid method in 6DOF motions, Computers & Fluids, Volume 140, 25 November 2016, Pages 19-38, ISSN 0045-7930, http://dx.doi.org/10.1016/j.compfluid.2016.09.005.

[2] V-T Nguyen and W-G Park, A free surface flow solver for complex three-dimensional water impact problems based on the VOF method. Int. J. Numer. Meth. Fluids, 82: 3–34 (2016), ISSN: 1097-0363. doi: 10.1002/fld.4203.

[1] V-T Nguyen, D-T Vu, W-G Park, Y-R Jung, Numerical analysis of water impact forces using a dual-time pseudo-compressibility method and volume-of-fluid interface tracking algorithm, Computers & Fluids, Volume 10

3, 1 November 2014, Pages 18-33, ISSN 0045-7930, http://dx.doi.org/10.1016/j.compfluid.2014.07.007

International Conference papers:

[9] Nguyen, V.-T., Phan, T.-H., Duy, T.-N., Park, W.-G., 2021. Numerical simulation of supercavitating flow ar ound a submerged projectile near a free surface. 11th International Symposium on Cavitation, May 10-13, 2021, Daejon, Korea.

[8] V-T Nguyen, Phan T-H**,** and Park W-G. Modeling and simulation of free surface and water entry of bodies, The 5th International Conference on Engineering Mechanics and Automation (ICEMA 5) Hanoi, October 11÷12 , 2019.

[7] T.-H. Phan, **V.-T. Nguyen**, and W.-G. Park, "Numerical analysis of nonlinear interaction between an underw ater explosion bubble and a free surface," The 21st Cross Straits Symposium on Energy and Environmental Scie nce and Technology (CSS-EEST), China, 2019. 11.26.

[6] V-T Nguyen and W-G Park, Numerical simulation of free surface flows: a prelimi-nary evaluation of basic s olution methods, The Second International Conference On Mechanics, Oct. 15th-18th 2018, Silks Place, Yilan, Taiwan.

[5] V-T Nguyen and W-G Park, Advances in volume-of-fluid based simulations of 3D two-fluid flow problems including complex interfacial structures and breaking waves in engineering, 11th Asian Computational Fluid Dy namics Conference, Sept. 16-20, 2016, Dalian University of Technology, Dalain, China.

[4] V-T Nguyen, and W-G Park, Free surface flow solver for complex 3D water impact problems based on the VOF method, 11th Korea-Japan CFD workshop (KJCFD2015), 12, 2015, Kyushu university, Kasuga, Fukuoka 816-8580, Japan.

[3] V-T Nguyen, and W-G Park, 3D volume-of-fluid (VOF) based simulation of water impact problem using na vier-stokes computations, Proceedings of the ASME-JSME-KSME Joint Fluids Engineering Conference 2015 A JK2015-FED July 26-31, 2015, SEOUL, KOREA

[2] V-T Nguyen, D-T Vu and W-G Park, 2014, 3-D Numerical Simulation of Water Entry of Free Falling Objec ts Using Navier-Stokes Computations and Moving Chimera Grid Scheme, 10th Asian Computational Fluid Dyn amics Conference, Oct. 19-23 GRAND Hotel, Jeju, Korea.

[1] V-T Nguyen, C-T Ha and W-G Park, 2013, "Multiphase flow simulation of water-entry and –exit of axisym metric bodies", Proceedings of the ASME 2013 International Mechanical Engineering Congress & Exposition I MECE2013 November 13-21, 2013, San Diego, California, USA.

Domestic Conference papers:

[18]] V-T Nguyen, Phan T-H**,** and Park W-G., Numerical simulation of single bubble collapse using a geometri cal VOF method. Korean Society for Computational Fluids Engineering Conference (KSCFE), 2021.11, Incheo n, Korea.

[17] T.-H. Phan, **V.-T. Nguyen**, and W.-G. Park, "Numerical investigation of ventilated supercavitation of a pro jectile by hot exhaust gas," The Korean Society of Mechanical Engineers Conference (KSME) Conference, Gwa ngju Korea, 2021. 11.

[16] **V.-T. Nguyen**, T.-H. Phan, T-N Duy,and W.-G. Park, "Numerical simulation of transonic flow around a hi gh-speed projectile," The Korean Society of Mechanical Engineers Conference (KSME) Conference, Deajon, K orea, 2021. 08.

[15**] V-T Nguyen**, and W-G Park, Numerical study of ricochet behaviors of a cylinder on water using an efficie nt two-phase model. Korean Society for Computational Fluids Engineering Conference (KSCFE), 05-2019, Jeju , Korea.

[14**]] V-T Nguyen**, Phan T-H**,** and Park W-G., Numerical simulation of compressible two-phase flows using a f ive-equation model. Korean Society for Computational Fluids Engineering Conference (KSCFE), 11-2019, Gun san, Korea.

[13] T.-H. Phan, **V.-T.Nguyen**, and W.-G.Park, "Local dynamics of a free-field underwater explosion bubble: A Numerical study," Korean Society for Computational Fluids Engineering (KSCFE) Conference. 2019. 05. 10.

[12] T.-H. Phan, **V.-T. Nguyen**, and W.-G. Park, "Numerical simulation of the dynamics of a spark-generated b ubble near a free surface," The Korean Society of Mechanical Engineers Conference (KSME) Conference, Kore

a, 2019. 11.15.

[11] V-T Nguyen, and W-G Park, Numerical simulation of two- and three-phase flows using a sharp interface c apturing method. Korean Society for Computational Fluids Engineering Conference (KSCFE), 05-2018, Jeju, K orea.

[10] V-T Nguyen, and W-G Park, Numerical simulation of two-phase flows using volume-of-fluid (VOF) interf ace-sharpening method. KSCFE, 05-2017, Korea.

[9] V-T Nguyen, and W-G Park, Enhancements in VOF based solver for complex interfacial structure simulatio ns in engineering, 9th National Congress of fluid engineering, 10, 2016, 9NCFE,EXCO, Korea.

[8] V-T Nguyen, and W-G Park, Numerical Simulation of Water Entry of Objects in 6DOF Motions, Korean So ciety for Mechanical Engineering (KSME) 2015 Annual Meeting, 11, 2015., Jeju, Korea

[7] D-T Vu, **V-T Nguyen**, D-H Kim, W-G Park and C-M Jung, Numerical study of steady and unsteady superca vitating flows around underwater vehicles, KSCFE, 2014, Jeju, Korea.

[6] V-T Nguyen, D-T Vu, and W-G Park, Application of moving chimera grid technology in numerical simulati on of water impact problem, KSCFE, 2014, Jeju, Korea.

[5] D-T Vu, **V-T Nguyen**, D-H Kim and W-G Park, "Numerical investigation of acceleration process of an unde rwater vehicle with ventilation of hot gas", KSCFE, Seoul, Korea.

[4] V-T Nguyen, D-T Vu, C-T Ha and W-G Park, "Application of Volume of Fluid Interface Tracking Method t o Simulation of Water Impact", KSCFE, 2013, Jeju, Korea.

[3] V-T Nguyen, C-T Ha and W-G Park, "Numerical simulation of vertical water-exit and water-entry of cavitat ing", KSCFE, 2012, Busan, Korea.

[2] V-T Nguyen, C-T Ha and W-G Park, "Numerical simulation of the natural-and ventilated-cavitating flows a round underwater bodies with multi-phase homogeneous mixture model", KSCFE, 2012, Jeju, Korea.

[1] TB Dang, **V-T Nguyen**, "An application of Kalman Filter (a data assimilation method) to correct and predict the result of hydrographic models", Proceeding of National Conference on Fluid Mechanics,07/ 2009, Danang, Vietnam.