Yongho Choi **Curriculum Vitae**

ADDRESS

Division of Mathematics and Big Data, Daegu University. Office: (053) 850-6415
201 Daegudaero, Jillyang, Gyeongsan, Gyeongbuk, 38453, Republic of Korea
e-mail: yongho_choi@daegu.ac.kr Web: http://appliedmath.synology.me/wordpress/

POSITION

- Assistant Professor, in Division of Mathematics and Big Data, Daegu University, 2019-.
- Post-Doc., in BK21 Plus Mathematical Science Division, Korea University, 2018-2019.

EDUCATION

- M.S. & Ph.D., Applied Mathematics, Korea University, Korea, 2012-2018
  - Advisor : Professor, Junseok Kim
  - Dissertation : Solving various partial differential equations on non-flat surfaces
- B.S., Mathematics(Minor is Education), Kyonggi University, Korea, 2007-2012
  - Advisor : Professor, Dong Hyun Cho

Awards

- 2020 KSIAM Outstanding Young Investigator Award,
  from Korean Society for Industrial and Applied Mathematics, 2020.
- 2020 Best Teaching Award,
  from Daegu University, 2020.
- 2019 KMS Dissertation Award,
  from Korean Mathematical Society, 2019.
- 2018 Best Teaching Award,
  from Korea University, 2018.
- 2018 KSIAM Young Researcher Award,
  from Korean Society for Industrial and Applied Mathematics, 2018.
- 2017 KU Graduate School Achievement Award,
  from Korea University, 2018.
- Marquis who's who in the world 2016, 33th,
  from Marquis Who's Who, 2016.
- 2016 Presentation Award,
  from Korean Society for Industrial and Applied Mathematics, 2016.
- 2015 2nd semester Excellent Paper Award of the Graduate School,
  from Korea University, 2016.

Certifacations

- MATLAB Associate certification,
  from MathWorks, 2015.
- Teacher certification (Middle and High school, mathematics and education),
  from the Ministry of Education, Science and Technology of Korea, 2012.

RESEARCH INTEREST

- Partial differential equations(PDEs) on surfaces
- Mathematical Biology: Pattern formation
- Image analysis
- Crystal growth & melting with and without flow
- Multigrid on the uniform and nonuniform grid
- Parallel Computation
- Numerical Analysis
- Scientific Computing

RESEARCH PUBLICATIONS

42. Explicit hybrid numerical method for the reaction-diffusion type equations on curved surfaces (SCIE)
Yongho Choi, Yibao Li, Chaeyoung Lee, Hyundong Kim, and Junseok Kim
Numerical Mathematics: Theory, Methods and Applications,
Vol. 14, pp. 797–810, 2021.

41. Calibration of the temporally varying volatility and interest rate functions (SCIE)
Eunchae Park, Jisang Lyu, Sangkwon Kim, Chaeyoung Lee, Wonjin Lee, **Yongho Choi**, Soobin Kwak, Changwoo Yoo, Hyeongseok Hwang, and Junseok Kim
International Journal of Computer Mathematics,
pp. 1–14, 2021.

40. A simple visualization method for three-dimensional (3D) network (SCIE)
Sangkwon Kim, Chaeyoung Lee, Jintae Park, Sungha Yoon, **Yongho Choi**, and Junseok Kim
Discrete Dynamics in Nature and Society,
Vol. 2021, pp. 1426212-1–1426212-10, 2021.

39. A practical adaptive grid method for the Allen–Cahn equation (SCIE)
Darae Jeong, Yibao Li, **Yongho Choi**, Chaeyoung Lee, Junxiang Yang, and Junseok Kim
Physica A: Statistical Mechanics and its Applications,
Vol. 573, pp. 125975-1–125975-12, 2021.

38. Periodic travelling wave solutions for a reaction-diffusion system on landscape fitted domains (SCIE)
Sangkwon Kim, Jintae Park, Darae Jeong, **Yongho Choi**, Soobin Kwak, and Junseok Kim
Chaos, Solitons & Fractals,
Vol. 139, pp. 110300-1–110300-9, 2020.

37. Fast and accurate volume smoothing method using a modified Allen-Cahn equation (SCIE)
Jian Wang, Yibao Li, **Yongho Choi**, Chaeyoung Lee, and Junseok Kim
Computer-Aided Design,
Vol. 120, pp. 102804-1–102804-12, 2020.

36. Mathematical modeling and computer simulation of the three-dimensional pattern formation of honeycombs (SCIE)
Darae Jeong, Yibao Li, Sangkwon Kim, **Yongho Choi**,
Chaeyoung Lee, and Junseok Kim
Scientific Reports,
Vol. 9, pp. 20364-1–20364-6, 2019.

35. The Cahn–Hilliard Equation with Generalized Mobilities in Complex Geometries (SCIE)
Jaemin Shin, **Yongho Choi**, and Junseok Kim
Mathematical Problems in Engineering,
Vol. 2019, pp. 1710270-1–1710270-10, 2019.

34. Android application for pricing two-and three-asset equity-linked securities (KCI)
Hanbyeol Jang, Hyunsoo Han, Hayeon Park, Wonjin Lee, Jisang Lyu,
Jintae Park, Hyundong Kim, Chaeyoung Lee, Sangkwon Kim,
Yongho Choi, and Junseok Kim
Journal of the Korea Society for Industrial and Applied Mathematics,
Vol. 23, pp. 237–251, 2019.

33. Three dimensional volume reconstruction based on modified fractional Cahn-Hilliard equation (KCI)
Yongho Choi and Seunggyu Lee
Journal of the Korea Society for Industrial and Applied Mathematics,
Vol. 23, pp. 203–210, 2019.

32. Verification of convergence rates of numerical solutions for parabolic equations (SCIE)
Darae Jeong, Yibao Li, Chaeyoung Lee, Junxiang Yang,
Yongho Choi, and Junseok Kim
Mathematical Problems in Engineering,
Vol. 2019, pp. 8152136–8152146, 2019.

31. Finite difference method for the two-dimensional Black-Scholes equation with a hybrid boundary condition (KCI)
Youngjin Heo, Hyunsoo Han, Hanbyeol Jang, **Yongho Choi**, and Junseok Kim
Journal of the Korea Society for Industrial and Applied Mathematics,
Vol. 23, pp. 19–30, 2019.

30. Modelling and simulation of the hexagonal pattern formation of honeycombs by the immersed boundary method (SCIE, IF 2.784)
Darae Jeong, **Yongho Choi**, and Junseok Kim
Communications in Nonlinear Science and Numerical Simulation,
Vol. 62, pp. 61–77, 2018.

29. A benchmark problem for the two- and three-dimensional Cahn–Hilliard equations (SCIE, IF 2.784)
Darae Jeong, **Yongho Choi**, and Junseok Kim

Communications in Nonlinear Science and Numerical Simulation,
Vol. 61, pp. 149–159, 2018.

28. Efficient 3D volume reconstruction from a point cloud using a phase-field method (SCIE, IF 0.802)

Darae Jeong, Yibao Li, Heonju Lee, Sangmin Lee, Junxiang Yang, Seungwoo Park, Hyundong Kim, **Yongho Choi**, and Junseok Kim
Mathematical Problems in Engineering,
Vol. 2017, pp. 7090186, 9 page, 2017.

27. Curve and surface smoothing using a modified Cahn–Hilliard equation (SCIE, IF 0.802)

Yongho Choi, Darea Jeong, and Junseok Kim
Mathematical Problems in Engineering,
Vol. 2017, pp. 5971295, 9 page, 2017.

26. Computationally efficient adaptive time step method for the Cahn–Hilliard equation (SCI, IF 1.531)

Yibao Li, **Yongho Choi**, and Junseok Kim
Computers & Mathematics with Applications,
Vol. 73, pp. 1855–1864, 2017.

25. Numerical simulation of the zebra pattern formation on a three-dimensional model (SCI, IF 2.243)

Darae Jeong, Yibao Li, **Yongho Choi**, Minhyun Yoo, Dooyoung Kang, Junyoung Park, Jaewon Choi, and Junseok Kim
Physica A: Statistical Mechanics and its Applications,
Vol. 475, pp. 106–116, 2017.

24. A finite difference method for a conservative Allen–Cahn equation on non-flat surfaces (SCI, IF 2.746, 5.4%)

Junseok Kim, Darae Jeong, Seong-Deog Yang, and **Yongho Choi**
Journal of Computational Physics,
Vol. 334, pp. 170–181, 2017.

23. A simple and efficient outflow boundary condition for the incompressible Navier–Stokes equations(SCIE, IF 1.167)

Yibao Li, Jung-II Choi, **Yongho Choi**, and Junseok Kim
Engineering Applications of Computational Fluid Mechanics,
Vol. 11, pp. 69–85, 2017.

22. Basic principles and practical applications of the Cahn–Hilliard equation (SCIE, IF 0.802)

Junseok Kim, Seunggyu Lee, **Yongho Choi**, Seok-Min Lee, and Darae Jeong
Mathematical Problems in Engineering,
Vol. 2016, pp. 9532608, 11 page, 2016.

21. A multigrid solution for the Cahn–Hilliard equation on nonuniform grids (SCIE, IF 1.738)

Yongho Choi, Darae Jeong, and Junseok Kim

Applied Mathematics and Computation,
Vol. 293, pp. 320–333, 2017.

20. Path Averaged Option Value Criteria for Selecting Better Options (KCI)
Junsok Kim, Minhyun Yoo, Hyeju Son, Seunggyu Lee, Myeong-Hyeon Kim, **Yongho Choi**, Darae Jeong, and Youngrock Kim
Jornal of Korean Society for Industrial and Applied Mathematics,
Vol. 20, pp. 163–174, 2016.

19. Numerical investigation of local defectivity control of diblock copolymer patterns (SCIE, IF 0.882)
Darae Jeong, **Yongho Choi**, and Junseok Kim
Condensed Matter Physics,
Vol. 19, pp. 33001, 10page, 2016.

18. A practical finite difference method for the three-dimensional Black–Scholes equation (SCIE, IF 3.297)
Junseok Kim, Taekkeun Kim, Jaehyun Jo, **Yongho Choi**, Seunggyu Lee, Hyeongseok Hwang, Minhyun Yoo, and Darae Jeong
European Journal of Operational Research,
Vol. 252, pp. 183–190, 2016.

17. Comparison of numerical methods for ternary fluid flows: immersed boundary, level-set, and phase-field methods (KCI)
Seunggyu Lee, Darae Jeong, **Yongho Choi**, and Junseok Kim
Jornal of Korean Society for Industrial and Applied Mathematics,
Vol. 20, pp. 83–106, 2016.

16. The daily computed weighted averaging basic reproduction number $R^n_{0,k,w}$ for MERS-CoV in South Korea (SCI, IF 2.243)
Darae Jeong, Chang Hyeong Lee, **Yongho Choi**, and Junseok Kim
Physica A: Statistical Mechanics and its Applications,
Vol. 451, pp. 190–197, 2016.

15. A fast and robust numerical method for option prices and Greeks in a jump-diffusion model (KCI)
Darae Jeong, Youngrock Kim, Seunggyu Lee, **Yongho Choi**, Woongki Lee, Jaeman Shin, Hyorim An, Hyeong Seok Hwang, and Junseok Kim
J. Korean Soc. Math. Educ. Ser. B: Pure Appl. Math.,
Vol. 22, pp. 159–168, 2015.

14. Motion by mean curvature of curves on surfaces using the Allen–Cahn equation (SCI, IF 4.261, 4.7%)
Yongho Choi, Darae Jeong, Seunggy Lee, Minhyun Yoo, and Junseok Kim
International Journal of Engineering Science,
Vol. 97, pp. 126–132, 2015.

13. Numerical implementation of the two-dimensional incompressible Navier–Stokes equation (KCI)
Yongho Choi, Darae Jeong, Seunggy Lee, and Junseok Kim

Jornal of Korean Society for Industrial and Applied Mathematics,
Vol. 19, pp. 103–121, 2015.

12. A modified Cahn–Hilliard equation for 3D volume reconstruction from two planar cross sections (KCI)
Seunggyu Lee, **Yongho Choi**, Doyoon Lee, Hong-Kwon Jo, Seunghyun Lee, Sunghyun Myung, and Junseok Kim
Jornal of Korean Society for Industrial and Applied Mathematics,
Vol. 19, pp. 47–56, 2015.

11. Three-dimensional volume reconstruction from slice data using phase-field models (SCI, IF 2.498)
Yibao Li, Jaemin Shin, **Yongho Choi**, and Junseok Kim
Computer Vision and Image Understanding,
Vol. 137, pp. 115–124, 2015.

10. Robust and accurate method for the Black–Scholes equations with payoff-consistent extrapolation (KCI)
Yongho Choi, Darae Jeong, Junseok Kim, Young Rock Kim, Seunggyu Lee, Seungsuk Seo, and Minhyun Yoo
Communications of the Korean Mathematical Society,
Vol. 30, pp. 297-–311, 2015.

9. Energy-minimizing wavelengths of equilibrium states for diblock copolymers in the hex-cylinder phase (SCI, IF 1.971)
Darae Jeong, Seunggyu Lee, **Yongho Choi**, and Junseok Kim
Current Applied Physics,
Vol. 15, pp. 799–804, 2015.

8. A hybrid numerical method for the phase-field model of fluid vesicles in three-dimensional space (SCI, IF 1.652)
Jaemin Shin, Darae Jeong, Yibao Li, **Yongho Choi**, and Junseok Kim
International Journal for Numerical Methods in Fluids,
Vol. 78, pp. 63–75, 2015.

7. Accuracy, robustness, and efficiency of the linear boundary condition for the Black–Scholes equations (SCIE, IF 0.711)
Darae Jeong, Seungsuk Seo, Hyeongseok Hwang, Dongsun Lee,
Yongho Choi, and Junseok Kim
Discrete Dynamics in Nature and Society,
Vol. 2015, pp. 359028, 10 pages, 2015.

6. A conservative Allen–Cahn equation with a space-time dependent Lagrange multiplier (SCI, IF 4.261, 4.7%)
Junseok Kim, Seunggyu Lee, and **Yongho Choi**
International Journal of Engineering Science,
Vol. 84, pp. 11–17, 2014.

5. An unconditionally stable numerical method for the viscous Cahn–Hilliard equation (SCI, IF 0.994)

Jaemin Shin, **Yongho Choi**, and Junseok Kim
Discrete and Continuous Dynamical Systems-Series B,
Vol. 19, pp. 1737–1747, 2014.

4. Numerical analysis of energy-minimizing wavelengths of equilibrium states for diblock copolymers (SCI, IF 1.971)
Darae Jeong, Jaemin Shin, Yibao Li, **Yongho Choi**, Jae-Hun Jung,
Seunggyu Lee, and Junseok Kim
Current Applied Physics,
Vol. 14, pp. 1263–1272, 2014.

3. Comparison of numerical methods (Bi-CGSTAB, OS, MG) for the 2D Black–Scholes equation (KCI)
Darae Jeong, Sungki Kim, **Yongho Choi**, Hyangseok Hwang, and Junseok Kim
J. Korean Soc. Math. Educ. Ser. B: Pure Appl. Math.,
Vol. 21, pp. 129–139, 2014.

2. Accurate and efficient computations for the Greeks of European multi-asset options (KCI)
Seunggyu Lee, Yibao Li, **Yongho Choi**, Hyangseok Hwang, and Junseok Kim
Jornal of Korean Society for Industrial and Applied Mathematics,
Vol. 18, pp. 61–74, 2014.

1. An adaptive multigrid technique for option pricing under the Black–Scholes model (KCI)
Darae Jeong, Yibao Li, **Yongho Choi**, Kyoung-sook Moon, and Junseok Kim
Jornal of Korean Society for Industrial and Applied Mathematics,
Vol. 17, pp. 295–306, 2013.

PRESENTATIONS

17. Numerical Study and Application of Partial Differential Equations on 3D Surfaces,
Oral, 20201112, KSIAM, Korea,
2020 KSIAM Outstanding Young Investigator Award.

16. Numerical simulation of COVID19 phenomenon using pre-processing data
Oral, 20201024, KMS, Online conference, Korea.

15. Mathematical modeling
Oral, 20200812-13, Michuhol Foreign Language High School, Korea.

14. Finite difference method for a conservative Allen–Cahn equation on non-flat surfaces,
Oral, 20190329, Kyungpook National University, Korea,
2019 Mini Symposium on Topics in Applied Mathematics and PDE.

13. Finite difference method for a conservative Allen–Cahn equation on non-flat surfaces,

Oral, 20180723, IACM, New York, USA, International Conference.

12. **What is applied mathematics & How to apply**,
Oral, Invited talk, Gyeonggibuk Science High School, Korea.

11. **Finite difference method for a conservative Allen–Cahn equation on non-flat surfaces**,
Oral, 20180525, KSIAM, Korea, 2017 KSIAM Young Researcher Award.

10. **Solving the Allen–Cahn equation on curved surfaces in three-dimensional space**,
Poster, 20180201, Korea Univ. Korea.

9. **Multigrid solution for the Cahn–Hilliard equation on nonuniform grids**,
Oral, Chair, 20171103, KSIAM, Korea.

8. **Solving a conservative Allen–Cahn equation on non-flat surfaces**,
Oral, 20170624, KSIAM, Korea.

7. **Numerical simulation for the fluid vesicles in 3D with flow**,
Oral, 20160728, IACM, Korea, International Conference.

6. **Solving the Allen–Cahn equation on curved surfaces in three-dimensional space**,
Poster, 20160520, KSIAM, Korea, Presentation Award.

5. **Motion by mean curvature on surfaces using the Allen–Cahn equation**,
Oral, 20151120, KSIAM, Korea.

4. **Numerical simulation for the phase-field model of fluid vesicles in 3D**,
Poster, 20150918, KSMB, Korea.

3. **Using multigrid method for solving the Cahn–Hilliard equation on the non-uniform grids**,
Poster, 20150529, KSIAM, Korea.

2. **Numerical simulation for the phase-field model of fluid vesicles in 3D**,
Poster, 20141213, KIAS, Korea, International Conference.

1. **Mass conserving Allen–Cahn equation with a space-time dependent Lagrange multiplier**,
Oral, 20141025, KMS, Korea.

Teaching Experiences

- 2021.March∼2021.June : AI Convergence Math
- 2021.March∼2021.June : Mathematical modeling
- 2021.March∼2021.June : Applied mathematics I[Image Segmentation]
- 2021.March∼2021.June : Progrmming Language[Anaconda Python Data analysis]
- 2021.March∼2021.June : Introduction to Programming(1)[MATLAB]
- 2020.September∼2020.December : Methods of Computational Mathematics
- 2020.September∼2020.December : Applied Mathematics(2)
- 2020.September∼2020.December : Numerical Algorithm
- 2020.September∼2020.December : Introduction to Programming(2)[Python]
- 2020.September∼2020.December : Programming and Mathematics
- 2020.March∼2020.June : Data Analysis
- 2020.March∼2020.June : Progrmming Language[Python]
- 2020.March∼2020.June : Introduction to Programming(1)[MATLAB]
- 2019.September∼2019.December : Calculus II
- 2019.September∼2019.December : Applied mathematics II
- 2019.September∼2019.December : Advanced mathematics
- 2019.September∼2019.December : Information mathematics
- 2019.March∼2019.June : Calculus I
- 2019.March∼2019.June : Applied mathematics I
- 2019.March∼2019.June : Mathematical modeling
- 2019.March∼2019.June : Pre-Linear algebra
- 2018.June∼2018.July : Linear algebra I with Lab.
- 2018.March∼2018.June : Mathematics for computer science I
- 2017.September∼2017.December : Applied mathematics (Teaching Fellow)

For additional information: http://appliedmath.synology.me/wordpress/