SHORT BIOGRAPHICAL SKETCH OF KWANG-CHUN (K.C.) PARK
(Version as January 27, 2024)

PRESENT AFFILIATION

Professor Emeritus
Smead Department of Aerospace Engineering Sciences
University of Colorado, Campus Box 429
Boulder, CO 80309
Phone 303-492-6330
E-mail: kcpark@colorado.edu

Invited Professor
Department of Aerospace Engineering
KAIST
Yuseong-gu, Daejeon 305-701
Phone: 010-2908-1558
E-mail: kcpkaist@kaist.edu

CURRENT RESEARCH ACTIVITIES

Computational multiphysics including fluid-structure interaction, Design of membrnanous structures, Micro and nano-mechanical systems, Data-based modeling of aerospace systems, Engineering system identification

EXPERIENCE

6/2014 - present:
Ann and H. J. Smead Aerospace Engineering Sciences, University of Colorado, Boulder, Colorado. *Professor Emeritus.*

6/2010 - 2019 (1-3 weeks/year):
Departamento de Ingenieria de la Construccion y Proyectos de Ingenieria, Escuela Tecnica Superior de Ingenieria Universidad de Sevilla, Sevilla, Spain. *Invited Professor.*

1/2019 - 2023t:
Institute of Thermomechanics, The Czech Academy of Sciences, Prague, Czech Republic. *Advisory Board Member*

4/2019 - 10/2019:
Technical University of Brno, Brno, Czech Republic. *Invited Professor*

4/2015 - 2017(one month/each year):
Department of Civil Engineering, Lund University, Lund, Sweden. *Invited Professor.*

9/2016-2/2017:
Department of Naval and Ocean Engineering, Pusan National University, Busan, Korea. *Invited Professor.*

9/2014-2/2016:
Department of Mechanical Engineering, Korea University, Seoul, Korea. *Distinguished Invited Professor.*

11/1985-5/2014:
Department of Aerospace Engineering Sciences, Boulder, Colorado. *Professor.*

Established the Center for Space Structures and Controls (CSSC) and served as its founding Director (11/1985-8/1988). Director of Center for Aerospace Structures (CAS) (6/1991-8/1996).

Initiated a new graduate program in space structures and computational mechanics in the College of Engineering

Served as Technical Director, Center for Space Construction (a NASA-sponsored space engineering center) (9/1987-8/1988).

9/2013-12/2013: Department of Aeronautics and Astronautics, Stanford University, Stanford, CA. *Visiting Professor.*

6/2009-8/2013: Korea Advanced Institute of Science and Technology, Daegeon, Korea *WCU Visiting Professor.* Six months/year.

2002-2009: Korea Advanced Institute of Science and Technology, Daegeon, Korea *Distinguished Invited Professor.* One to three months/year.

1997-2009: Conservatoire National des Arts et Metiers, Paris, France. *Professeur Invité* during the summer.

6/2005-8/2005: Summer, 2005: Laboratoire de Sols Solides Structures, Domaine Universitaire, Grenoble, France. *Professeur Invité.*

9/1999 - 6/2000 Department of Aeronautics and Astronautics, Massachusetts Institute of Technology, Cambridge, Mass. *Visiting Professor.*

3/2000-5/2000: Institute of Space and Astronautical Science, Sagamihara, Kanagawa 229, Japan. *Visiting Professor.*

5/1996-8/1997 Summer, 1997: Institut National des Sciences Appliques de Rouen, Roeun, France *Professeur Invité.*

5/1996-7/1996 Summer, 1996: University of Paris VI and Joseph Fourier University of Grenoble *Professeur Invité.*

1/1992-12/1992: Fall, 1992 Institute of Space and Astronautical Science, Sagamihara, Kanagawa 229, Japan. *Visiting Professor.*

Summer, 1992 Laboratoire de Mecanique et Technologie, Ecole Normale Superieure de Cachan, 94235 Cachan Cedex, France. *Professeur Invité.*

Spring, 1992 Department of Aeronautics and Astronautics, Massachusetts Institute of Technology, Cambridge, Mass. *Visiting Professor.*

4/1980-10/1985: LOCKHEED MISSILES & SPACE CO., INC. Palo Alto Research Laboratory, Palo Alto, California. *Senior Staff Scientist.* Conducted and supervised research on dynamics of large space structures, finite element methods for nonlinear shells and coupled-field problems, algorithms for concurrent computations, partitioned analysis techniques for structure-medium interaction problems. Consulted other Lockheed Divisions on structural dynamics and finite element methods.

10/1979-3/1980: NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, Langley Research Center, Hampton, Virginia. *Visiting Scientist.* Conducted nonlinear modeling and dynamic analysis of thermal protection system for space shuttle's insulation ceramic tile and shock absorption pad. Conducted seminars on computational structural dynamics for NASA and other personnel at Langley.

2/1976-9/1979: LOCKHEED MISSILES AND SPACE COMPANY, INC., Palo Alto Research Laboratory, Palo Alto, California.
Research Scientist. Conducted research on improved transient analysis algorithms for computational structural dynamics and fluid-structure interaction problems.

4/1974-1/1976: *Associate Research Scientist.* Conducted research on vehicle crashworthiness and structural vulnerability.

4/1973-3/1974: LOCKHEED-CALIFORNIA COMPANY, Burbank, California. *Senior Structural Engineer.* Conducted experimental and analytical helicopter crashworthiness studies for U. S. Army Fort Eustis Transportation Research Center.

6/1972-3/1973: GEORGE WASHINGTON UNIVERSITY, Washington, D. C. The Fatigue Institute. *Research Assistant.* Performed nonlinear dynamics analysis of elastic-plastic structures by the finite element methods.

1/1971-5/1972: CLARKSON COLLEGE OF TECHNOLOGY, Potsdam, New York. *Graduate Research Assistant.* Conducted research to develop failure prediction techniques of impacted structures.

3/1968-7/1969: KOREA INSTITUTE OF SCIENCE AND TECHNOLOGY, Seoul, Korea. *Mechanical Engineer.* Performed the technology assessment of Korean automobile industry for instituting an automobile technology research and development center.

1/1966-2/1968: HANKUK MACHINE INDUSTRIAL COMPANY, Incheon, Korea. *Junior Design Engineer.* Performed manufacturing layout plans for machining diesel engine components including jigs and fixtures.

EDUCATION
Ph.D. (5/1975), Applied Mechanics and Systems Analysis, Clarkson College (1/1971-5/1975).
M.S. (6/1970), Controls, Stanford University, Stanford, California (9/1969-12/1970).
BSME (2/1966), Inha Institute of Technology, Incheon, Korea (3/1962-2/1966).

PROFESSIONAL ACTIVITIES

Technical Program Chairman, 1990 AIAA Dynamics Specialist Conference
Member, NASA/OAST Space Systems and Technology Advisory Committee (1985–1993)
Editorial Board, Communications in Applied Numerical Methods (1980-2004).
Editorial Board, Int'l Journal of Numerical Methods in Engineering (1978-2023)
Editorial Board, Computers & Structures: An International Journal (1998-2004)
Editorial Board, International Journal of Computational Engineering Science (IJCES) (1996-2003)
Editorial Board, Computer Methods in Engineering Sciences (CMES) (1996-2002)

HONORS AND AWARD Fellow (ASME), Recipient of the 2011 Computational Science and Engineering Award of the US Association for Computational Mechanics (USACM).

SELECT RECENT INVITED LECTURES

2023

A Novel Method of FEM Modeling and Solution without Assembling. Can It Be Possible?
    November 2, 2023: Korean Society of Mechanical Engineers, Songdo, Korea;
    October 12, 2023: CNAM (Paris, France);
    October 09, 2023: ISAE-SUPAERO (Toulouse, France);
    October 05, 2023: Pavia U. (Pavia, Italy);

October 03, 2023: Danish Technical U. (Lyngby, Denmark);
September 28, 2023: CIMNE(Barcelona, Spain);
September 26, 2023: Gustav Eiffel U. (Marne-la-Valee, France).

Dynamics: From Founding Fathers, Theoretical Developments, to Data-Driven Modeling of Engineering Systems. Department of Aerospace Engineering Sciences, University of Colorado, 31 January 2023.

A New Paradigm for Multiphysics Simulation: Report on Initial Applications. Plenary Lecture at the Xth International Conference on Coupled Problems in Science and Engineering. 05-07 June 2023.

The Renaissance of Korean Space Science and Engineering: Seize the Opportunity! The Satellite Research Institute, KAIST, 28 March 2023.

2021

Partitioned Analysis: Advances during 2001-Present and Future Challenges. Plenary Lecture at IX International Conference on Coupled Problems in Science and Engineering. 13-16 June 2021.

2019

Dynamics of Engineering Systems: Past, Present and Future Directions, Department of Mechanical Engineering, Korea University, Seoul, Korea. 29 October 2019.

Method of Localized Lagrange Multipliers and its Applications to Partitioned Solution of Large-Scale Structural Systems, Department of Transportation, Technical University of Prague, Prague, Czech Republic. 23 October, 2019.

Method of Localized Lagrange Multipliers and its Recent Applications: Multi-Physics, Reduced-Order Modeling, and Uncertainty Quantification, Department of Applied Mathematics, Charles University, Prague, Czech Republic. 21 October 2019.

Data-Driven Engineering Modeling: Is it a Reinvention of Old Techniques or a Genuine New Paradigm?, CIMNE, Barcelona, Spain. 15 October 2019.

Method of Localized Lagrange Multipliers and its Applications to Partitioned Solution of Large-Scale Structural Systems, Department of Applied Mathematics, Technical University of Ostrava, Czech Republic. 11 October, 2019.

Method of Localized Lagrange Multipliers and its Recent Applications: Multi-Physics, Reduced-Order Modeling, and Uncertainty Quantification, Department of Civil Engineering, Technical University of Vienna, Vienna, Austria. 26 April 2019.

Research Issues in Marine Vehicle Avoidance Technology Development, Korea Ship Safety Technology Authority, Sejong City, Korea. 25 March 2019.

2018

Data-Driven Engineering Modeling: Is it a Reinvention of Old Techniques or a Genuine New Paradigm? Department of Aerospace Engineering, Seoul National University, Seoul, Korea. 20 November 2018.

Data-Driven Engineering Modeling: Is it a Reinvention of Old Techniques or a Genuine New Paradigm? Department of Mechanical Engineering, Kyunghee University, Suwon, Korea. 8 November 2018.

Engineering Applications of Independent Component Analysis, Department of Mechanical Engineering, KAIST, Daejeon, Korea. 7 September 2018.

Method of Localized Lagrange Multipliers and its Applications to Partitioned Solution of Large-Scale Structural Systems, Department of Mathematics, KAIST, Daejeon, Korea. 9 March, 2018.

2017

Method of Localized Lagrange Multipliers and its Applications. *Plenary Lecture*, Korean SIAM Annual Conference, Busan, Korea, November 4, 2017.

Partitioned Analysis of Coupled Dynamical Systems: Recent Advances. *Plenary Lecture*, COMP-DYN2017 Conference, Rhodes, Greece, June 17, 2017.

2016

Vibration Control (a total of two lectures), Lund University, Lund, Sweden. 18-21 April 2016.

Vibration Control (a total of two lectures), Brauschweig University, Braunschweig, Germany. 25-29 April 2016.

Transient Analysis Methods for Partitioned Analysis (a total of four lectures), Prague University, Prague, Czech. 13-17 June 2016.

Direct time integration methods (a total of two lectures), Korea University, Seoul, Korea. 3-10 October 2016.

2015

Structural System Identification (a total of eight lectures), Lund University, Lund, Sweden. 20 April - 11 May 2015.

Partitioned Analysis and Interface Treatments (a total of three lectures), Leibniz University of Hannover, Hannover, Germany. 18-20 May 2015.

2014:

Title: A Simultaneous Tailoring of Flexible Structures and Feedback Control: an Interdisciplinary Approach, Braunschweig University, Braunschweig, Germany, July 17, 2014.

Title: Partitioned Multiphysics and Multiscale Simulation: Its Origin, Present Practice and Future Challenge, Pusan National University, Busan, Korea, October 30, 2014.

Title: Partitioned Multiphysics and Multiscale Simulation: Its Origin, Present Practice and Future Challenge, Sungkyunkwan University Suwon, Korea, 06 November 2014

Title: Eddy Viscosity-Driven Energy Loss Mechanisms, KAIST, Daejeon, Korea, November 20, 2014.

Title: Eddy Viscosity-Driven Energy Loss Mechanisms, Korea University, Seoul, Korea, November 25, 2014.

Title: Paradigm Changes from Analytical to Data-Driven Engineering Modeling: Is It a Boon or Menace?, Inha University, Incheon, Korea, December 15, 2014.

RECENT PUBLICATIONS (since 2016)

Web of Science citations: over 4,100 citations with h-index=33
(http://www.researcherid.com/rid/E-8898-2010);

Google scholar citations: over 9,900 with h-index=51, i10-index = 151
http://scholar.google.com/citations?user=wut%5C_ihkAAAAJ&user=wut_ihkAAAAJJ

1. R. Lang , I. Nemec and K.C. Park. Stress projection procedure for the form-finding analysis of membrane structures. Engineering Structures 300 (2024) 117173.

https://doi.org/10.1016/j.engstruct.2023.117173

2. K.C.Park, J.A.Gonzlez, Y..H.Park, S.J.Shin, J.G.Kim5, K.K.Maute, C. Farhat, C. A. Felippa. Displacement-based partitioned equations of motion for structures: Formulation and proof-of-concept applications. International Journal for Numerical Methods in Engineering. 124(22), 2023, 5020-5046. http://doi.org/10.1002/nme.7334

3. JA González, KC Park. Three-field partitioned analysis of fluid-structure interaction problems with a consistent interface model. Computer Methods in Applied Mechanics and Engineering 414, 116134, 2023.

4. R. Dvorák, R. Kolman, T. Fíla, J. Falta, K.C. Park. Explicit asynchronous time scheme with local push-forward stepping for discontinuous elastic wave propagation: One-dimensional heterogeneous cases and Hopkinson bar experiment Wave Motion, 103169, https://doi.org/10.1016/j.wavemoti.2023.103169

5. C Ahn, A Cortiella, JG Kim, KC Park. Partitioned symmetric formulation and solution algorithm of thermoelastic interaction problems, Computer Methods in Applied Mechanics and Engineering 400, 115529, 2022

6. A Cortiella, KC Park, A Doostan. A Priori Denoising Strategies for Sparse Identification of Nonlinear Dynamical Systems: A Comparative Study. Journal of Computing and Information Science in Engineering, 1-34, 2022. arXiv preprint arXiv:2201.12683. 2022

7. I. S. Chung, J. G. Kim S. W. Chae, K. C. Park. An iterative scheme of flexibility-based component mode synthesis with higher-order residual modal compensation. International Journal for Numerical Methods in Engineering, 2021. https://doi.org/10.1002/nme.6656

8. J. A. Gonzalez, J. Kopacka, R. Kolman and K. C. Park. Partitioned formulation of frictionless contact-impact problems with stabilized contact constraints and reciprocal mass matrices. International Journal for Numerical Methods in Engineering, 2021. https://doi.org/10.1002/nme.6739

9. Radek Kolman Jan Kopacka, Jose Gonzalez, S.S.Cho, K.C.Park. Bi-penalty stabilized technique with predictor?corrector time scheme for contact-impact problems of elastic bars. Mathematics and Computers in Simulation. https://doi.org/10.1016/j.matcom.2021.03.023

10. J Kang, KC Park. Flexible heliogyro solar sail under solar radiation pressure and gravitational force. Acta Astronautica 179, 186-196, 2021.

11. A Cortiella, KC Park, A Doostan. Sparse Identification of Nonlinear Dynamical Systems via Reweighted ℓ_1-regularized Least Squares. Computer Methods in Applied Mechanics and Engineering 376, 113620, 2021.

12. HS Choi, JG Kim, A Doostan, KC Park. Acceleration of uncertainty propagation through Lagrange multipliers in partitioned stochastic method. Computer Methods in Applied Mechanics and Engineering 362, 112837, 2020.

13. J Kang, KC Park. Solarelastic Instability of Periodically Time-Varying Heliogyro Blade. Journal of Spacecraft and Rockets 57 (2), 398-404, 2020.

14. Gil-Eon Jeong, Yeo-Ul Song, Sung-Kie Youn, K. C. Park. A New Approach for Non-matching Interface Construction by the Method of Localized Lagrange Multipliers. Computer Methods in Applied Mechanics and Engineering 361, 112728, 2020.

15. Jose A. Gonzalez, K. C. Park. Accelerating the convergence of AFETI partitioned analysis of heterogeneous structural dynamical systems. Computer Methods in Applied Mechanics and

Engineering 360, 112726, 2020.

16. Jose A. Gonzalez, K. C. Park. Large-Step Explicit Time Integration via Mass Matrix Tailoring. International Journal for Numerical Methods in Engineering 121 (8), 1647-1664, 2020.

17. S. S. Cho, R. Kolman, K. C. Park and J. A. Gonzalez. Explicit multistep time integration for discontinuous elastic stress wave propagation in heterogeneous solids. International Journal for Numerical Methods in Engineering 118 (5), 276-302, 2019.

18. SM Kim, JG Kim, SW Chae, KC Park. A strongly coupled model reduction of vibro-acoustic interaction. Computer Methods in Applied Mechanics and Engineering 347, 2019, 495-516.

19. SM Kim, JG Kim, KC Park, SW Chae. Iterative Component Mode Synthesis Using a Priori and a Posteriori Criteria. AIAA Journal 57 (5), 2145-2157, 2019.

20. JA Gonzalez, J Kopacka, R Kolman, SS Cho, KC Park. Inverse mass matrix for isogeometric explicit transient analysis via the method of localized Lagrange multipliers International Journal for Numerical Methods in Engineering 117 (9), 2019, 939-966

21. IS Chung, JG Kim, SW Chae, KC Park. Formulation of Flexibility-Based Component Mode Synthesis for Transient Analysis. AIAA Journal, 2018, 1-12

22. Soo Min Kim, Jin-Gyun Kim, Soo-Won Chae, K.C. Park. A component mode selection method based on a consistent perturbation expansion of interface displacement. Comp. Meth. Appl. Mech.& Eng. 330, 2018, 277-295.

23. GE Jeong, SK Youn, KC Park (2018) Topology optimization of deformable bodies with dissimilar interfaces Computers & Structures 198, 1-11.

24. S Sei, KC Park, HS Park (2018) A staggered explicit?implicit finite element formulation for electroactive polymers Comput. Methods Appl. Mech. Engrg. 337, 2018, 150-164.

25. GE Jeong, SK Youn, KC Park (2018) Minimum influence point method to construct fictitious frame domain for treating nonmatching interface meshes Journal of Mechanical Science and Technology. 32 (3), 2018, 1253-1260.

26. SM Kim, JG Kim, KC Park, SW Chae (2018) A component mode selection method based on a consistent perturbation expansion of interface displacement Computer Methods in Applied Mechanics and Engineering. 330, 2018, 578-597.

27. JA Gonzlez, R Kolman, SS Cho, CA Felippa, KC Park (2018) Inverse mass matrix via the method of localized lagrange multipliers International Journal for Numerical Methods in Engineering 113 (2), 277-295,2018

28. González, J. A., Kolman, R., Cho, S. S., Felippa, C. A., and Park, K. C. (2017). Inverse Mass Matrix via the Method of Localized Lagrange Multipliers. Int. J. Numer. Meth. Engng, doi: 10.1002/nme.5613.

29. YU Song, SK Youn, KC Park. Virtual gap element approach for the treatment of non-matching interface using three-dimensional solid elements. Computational Mechanics, 60 (4), 585-594, 2017.

30. José A. Gonzaléz, Yeon-Seung Lee, K.C. Park. Stabilized mixed displacement-pressure finite element formulation for linear hydrodynamic problems with free surfaces. Computer Methods in Applied Mechanics and Engineering 319, 2017,314-337.

31. R. Kolman, S.S. Cho and K.C. Park. Efficient implementation of an explicit partitioned shear

and longitudinal wave propagation algorithm. *International Journal for Numerical Methods in Engineering*, Volume 107, 543-579, 2016.

32. Tae-Won Na, Jun-Ho Choi, Jin-Young Jung, Hyeong-Geon Kim, Jae-Hung Han, K. C. Park and Il-Kwon Oh. Compact piezoelectric tripod manipulator based on a reverse bridge-type amplification mechanism. Smart Materials and Structures, Volume 25, Number 9, 2016.

SELECT PUBLICATIONS (Prior to 2016 and out of 250-plus publications)

33. Partitioned analysis of coupled mechanical systems. CA Felippa, KC Park, C Farhat. Computer methods in applied mechanics and engineering 190 (24-25), 3247-3270, 2001

34. Staggered transient analysis procedures for coupled mechanical systems: formulation. CA Felippa, KC Park. Computer Methods in Applied Mechanics and Engineering 24 (1), 61-111,1980

35. A Curved C0 Shell Element Based on Assumed Natural-Coordinate Strains KC Park, GM Stanley. J. Appl. Mech. Jun 1986, 53(2): 278-290

36. An improved stiffly stable method for direct integration of nonlinear structural dynamic equations. KC Park. J. Appl. Mech. Jun 1975, 42(2): 464-470

37. Partitioned analysis of coupled systems. KC Park, CA Felippa. Computer Methods in Applied Mechanics and Engineering Volume 190, Issues 24?25, 2 March 2001, Pages 3247-3270.

38. Stabilization of staggered solution procedures for fluid-structure interaction analysis. KC Park, CA Felippa, JA DeRuntz. Computational methods for fluid-structure interaction problems 26 (94-124), 51,1977

39. A variational principle for the formulation of partitioned structural systems. KC Park, CA Felippa. International Journal for Numerical Methods in Engineering 47 (1?3), 395-418, ,2000

40. Second-order structural identification procedure via state-space-based system identification. KF Alvin, KC Park. AIAA journal 32 (2), 397-406, 1994

41. Structural system identification: from reality to models. KF Alvin, AN Robertson, GW Reich, KC Park Computers & structures 81 (12), 1149-1176 204 2003

42. Partitioned transient analysis procedures for coupled-field problems: stability analysis. KC Park. J. Appl. Mech. Jun 1980, 47(2): 370-376

43. A simple algorithm for localized construction of non?matching structural interfaces. KC Park, CA Felippa, G Rebel. International Journal for Numerical Methods in Engineering 53 (9), 2117-2142, ,2002

44. Stabilization of computational procedures for constrained dynamical systems. KC Park, JC Chiou. Journal of Guidance, Control, and Dynamics 11 (4), 365-370,1988

45. Partitioned formulation of internal fluid?structure interaction problems by localized Lagrange multipliers KC Park, CA Felippa, R Ohayon Computer Methods in Applied Mechanics and Engineering 190 (24-25), 2989-3007,2001

46. A localized version of the method of Lagrange multipliers and its applications. KC Park, CA Felippa, UA Gumaste. Computational Mechanics 24 (6), 476-490 137 2000

47. A variational framework for solution method developments in structural mechanics. KC Park, CA Felippa. Journal of Applied Mechanics 65 (1), 242-249 136 1998

48. Extraction of impulse response data via wavelet transform for structural system identification. AN Robertson, KC Park, KF Alvin. Journal of Vibration and Acoustics 120 (1), 252-260 126 1998

49. Practical aspects of numerical time integration KC Park Computers & Structures 7 (3), 343-353 125 1977

50. Structural tailoring and feedback control synthesis-An interdisciplinary approach WK Belvin, KC Park Journal of Guidance, Control, and Dynamics 13 (3), 424-429 124 1990

51. Evaluating time integration methods for nonlinear dynamics analysis, KC Park, Finite element analysis of transient nonlinear structural behavior, 35-58,1975

52. An algebraically partitioned FETI method for parallel structural analysis: algorithm description, KC Park, MR Justino Jr, CA Felippa. International Journal for Numerical Methods in Engineering 40 (15), 2717-2737,1997