

## RESUME: Duck-Joo Lee



### Professor

Department of Aerospace Engineering  
School of Mechanical, Aerospace and Systems Engineering  
Korea Advanced Institute of Science and Technology

May 12, 2017

#### 1. PERSONAL DATA

Name	Duck-Joo Lee
Title	Professor, Ph.D.
Affiliation	Korea Advanced Institute of Science and Technology
Birth Date/Place	April 29, 1954 / Seoul, Korea
Home Address	131-505 Hanbit Apt. Eoeun-D, Yuseong-K, Daejeon, Korea
Office Address	Department of Aerospace Engineering, KAIST, 373-1 Guseong Yuseong, Daejeon 305-701, Korea
Phone/Fax/E-mail	<i>Mobile</i> (Phone) + 82-10-5451-3716 <i>Office</i> (Phone) + 82-42-350-3716 (E-mail) <a href="mailto:djlee@kaist.edu">djlee@kaist.edu</a> (URL) <a href="http://acoustic.kaist.ac.kr">http://acoustic.kaist.ac.kr</a>

#### 2. MAJOR FIELD AND CURRENT RESEARCH INTERESTS

Major Field	Aeroacoustics, Aerodynamics
Research Interests	Computational Aeroacoustics (CAA), Rotor Noise, Jet noise, Space Rocket noise, ISS (International Space Station) noise

#### 3. EDUCATION

Feb. 1977	B.S. in Aerospace Engineering, Seoul National University, Seoul, Korea
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Jun. 1977 - Jun. 1979	Transportation Officer, Korean Army
Aug. 1980	M.S. in Aero & Astronautics, Stanford University
Sep. 1985	Ph.D. in Aero & Astronautics, Stanford University

#### **4. EMPLOYMENT**

Sep. 1985 - Dec. 1987	NRC Fellow, NASA Ames Research Center
Jan. 1988 - Dec. 1997	Assistant Professor, Associate Professor, Dept. of Aerospace Engineering, KAIST
Jan. 1998 - Present	Professor, Dept. of Aerospace Engineering, KAIST
Dec.1999- Aug.2001	Chairman, Dept. of Aerospace Engineering, KAIST
Mar.2009- Feb.2012	Head, Dept. of Aerospace Engineering, KAIST

#### **5. ACTIVITIES IN PROFESSIONAL SOCIETIES**

##### **A. SPECIAL ACTIVITIES**

- (1) Invited Researcher, Boeing Company, Seattle, U.S. 2007
- (2) Visiting Scholar, Korean Aerospace Research Institute,2007
- (3) National Task Force Team, Team Leader, Korean Attack Helicopter and Civil Helicopter, 2010-Present (Ministry of Knowledge and Economy, Ministry of Defense, Ministry of Land, Transportation and Maritime)
- (4) Technical Member, Korean Wind Turbine Technical Committee , 2010
- (5) Invited Researcher, Korean High Speed Train Research Institute, 2012
- (6) Principal Investigator, National Plan of Civil UAV (Unmanned Aerial Vehicle) infrastructure for Commercialization, Ministry of Land, Transportation and Maritime, 2012
- (7) President, 1<sup>st</sup> Asia-Australia Rotorcraft Form, 2012

##### **B. SERVICE ACTIVITIES FOR ACADEMIC JOURNALS**

- (1) Journal of the Acoustical Society of Korea (*in English*): Editor-in-Chief (2004-2006)
- (2) Journal of the American Helicopter Society: Associate Editor (2007-2014)

##### **C. MEMBERSHIP IN PROFESSIONAL SOCIETIES**

- (1) Korean Society for Aeronautical and Space Sciences (Member of Council, Board of Director, Chairman Rotary Wing Technology Committee)

- (2) Korean Society for Noise and Vibration Engineering (Chairperson of Transportation Machines Committee, Member of Council, Board of Director)
- (3) Acoustical Society of Korea (Member of Council, Board of Director, Editor-in-Chief, English edition)
- (4) Korean Society for Mechanical Engineering (Member)
- (5) Korean Society for Theoretical and Applied Engineering (Member)
- (6) Korean Society for Computational Fluid Engineering (Member)
- (7) American Institute of Aeronautics and Astronautics (Member)
- (8) American Helicopter Society (Member, Acoustic Committee)
- (9) International Institute of Acoustics and Vibration (Member)
- (10) Society of Human Completion (Board of Director)

#### **D. ACTIVITIES IN INTERNATIONAL CONGRESS**

- (1) Keynote speech, Board Member of International Advisory Committee, 1st *International Conference on Vortex Method*, Japan, 1999.
- (2) Board Member of International Advisory Committee, 2nd *International Conference on Vortex Method*, Turkey, 2001
- (3) Board Member of Scientific Committee, 2nd *Fan-noise* Conference, France, 2003
- (4) Chairman of Exhibition, *International Congress and Exposition on Noise Control Engineering (Inter-Noise 2003)*, Seogwipo, Jeju, Korea, 2001-2003, Held at August 25-28, 2003.
- (5) Board Member of International Advisory Committee, 3rd *International Conference on Vortex Flow and Vortex Method*, Japan, 2004
- (6) Co-organizer, Space and Aerospace Science and Technology Symposium in *UKC2005* (U.S. and Korea Conference on Science, Technology and Entrepreneurship), U.S., August 2005.
- (7) Chairman of Technical Program, *WESPAC9* (The 9<sup>th</sup> Western Pacific Acoustics Conference), June 2006, Seoul Korea.
- (8) Key Note Speech at *Parallel CFD*, May 2006, Pusan, Korea.
- (9) Board Member of Scientific Committee, 3<sup>rd</sup> *Fan-noise* Conference, France, 2007
- (10) Organizing Chairman, AHS Specialists' Meeting, *Rotor Korea 2007*, Seoul, Korea 2007
- (11) Organizer, Board Member of International Advisory Committee, 4<sup>th</sup> *International*

*Conference on Vortex Flow and Vortex Method*, Daejeon, Korea 2008

(12) Organizing Chairman, AHS Specialists' Meeting, *Rotor Korea 2009*, Seoul, Korea 2009

(13) Chairman, 1<sup>st</sup> *Asian-Australian Rotorcraft Form (ARF)*, 2012, Busan, Korea, Feb. 2012.

(12) Board Member of Executive Committee, 2<sup>nd</sup> *Asian-Australian Rotorcraft Forum (ARF)*, Tianjin, China, Sep. 2013

(13) Board Member of Executive Committee, 3<sup>rd</sup> *Asian-Australian Rotorcraft Forum (ARF)*, Melbourne, Australia, Dec. 2014

## **6. SCHOLARSHIPS AND AWARDS**

(1) NRC Fellow, NASA Ames Research Center, August 1985 - December 1987

(2) *Best Paper Award in Science and Technology*, The Korea Federation of Science and Technology Societies, April 1, 1998, Seoul, Korea.

(3) *Best Poster Paper Presentation Award*, Inter-Noise 2003 (The International Congress and Exposition on Noise Control Engineering), August 28, 2003, Seogwipo, Korea (with I-C Lee).

(4) *Academic Award*, Acoustical Society of Korea, October 31, 2003 Kyongju, Korea

(5) *Academic Award*, Korean Society for Aeronautical and Space Sciences, November, 2005, Korea.

(6) Elected as one of *40 Fellows in Aerospace Engineering in KOREA in the last 40 years*, Korean Society for Aeronautical and Space Sciences, October, 2007, Korea.

## **7. CONTINUING EDUCATION**

(1) Lecturer on one week short course titled "Computational Fluid Dynamics" held at KAIST, Aug. 1990

(2) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications" held at KAIST, Feb. 1991

(3) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications" held at KAIST, Feb. 1992

(4) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications" held at KAIST, Jan. 1993

(5) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics

- and Its Applications" held at KAIST, Feb. 1994
- (6) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications" held at KAIST, Feb. 1995
  - (7) Series of lectures on "Fundamentals of Aeroacoustics" for engineers at LG Electronics Co., Seoul, 1995 (4 Lectures for 12 Hours)
  - (8) Series of lectures on "Stealth Technology" for engineers at ADD (Agency for Defense Development), Daejeon, 1995 (2 Lectures for 6 Hours)
  - (9) Organizer and Lecturer on one week short course titled "Design of Helicopter" held at KAIST, Mar. 1996
  - (10) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications" held at KAIST, Jan. 1996
  - (11) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications" held at KAIST, Jan. 1997
  - (12) Series of lectures on "Fundamentals of Aeroacoustics" for engineers at Hyundai Motors Co., Namyang, 1997 (4 Lectures for 12 Hours)
  - (13) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications" held at KAIST, Feb. 1998
  - (14) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications" held at KAIST, Jan. 1999
  - (15) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications" held at KAIST, Feb. 2000
  - (16) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications," *Courses A & B*, held at KAIST, Feb. 2001.
  - (17) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications," *Courses A & B*, held at KAIST, Jan. 2002.
  - (18) Organizer and Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications," held at KAIST, Mar. 2003.
  - (19) Organizer and Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications," held at KAIST, Mar. 2004.
  - (20) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications," held at KAIST, April 2005.
  - (21) Lecturer on one week short course titled "Noise Control: Fundamentals of Acoustics and Its Applications," held at KAIST, Mar. 2006.

## 8. INVITED Speaker

- (1) Workshop by Korea Air Force, Korea Oct. 1996: "Stealth Technology"
- (2) Workshop on Wind tunnel, Korea, Jun. 1997: "KAIST Acoustic Wind Tunnel"
- (3) Internoise 1998, Nov. 1998: "Intake Noise"
- (4) 137<sup>th</sup> Acoustical Society of America, May 1995: "Computational Aeroacoustics"
- (5) Workshop by ATES Software Jul. 1997: "Fan Noise and Aeroacoustics"
- (6) Korea CFD Conference: "CAA"
- (7) Internal Congress of Acoustics (ICA): "Computational Aeroacoustics"
- (8) Key note speech, 1st *International Conference on Vortex Method*, Japan, 1999.
- (9) Key Note Speech at *Korea-Japan Thermal-Fluid Conference*, Mar 2005, Jeju Korea.
- (10) Key Note Speech at *Parallel CFD*, May 2006, Pusan, Korea.
- (11) Star-CD, User meeting, "CAA", May 2007, Pusan, Korea
- (12) Boeing, Seattle, "CFD, CAA and Fan Noise", July, 2007, U.S.
- (13) Halla Climate Control, WinD Workshop, Special Lecture,  
"Change of Thinking in the Engineer point of view", 2008
- (14) NIMS Hot Topics Workshop on High-Order Methods for Conservation Laws, "Acoustic Flow and Feedback Phenomena using Optimized High Order Compact (OHOC) scheme", Aug. 2014, Daejeon, Korea.
- (15) The Korean Society for Aeronautical & Space Sciences, "Aeroacoustic Analysis using Optimized High Order and High Resolution schemes," April 2015, Kangwon, Korea.
- (16) Seminar at Korea Aerospace Industries, "Aeroacoustic/Acoustic Problems in Supersonic vehicle," July 20, 2015.
- (17) 2015 MSC Korea Industrial Forum, "Aeroacoustics and Application to Development of Aircraft," Aug. 28, 2015.

## 9. REVIEW SERVICE EXPERIENCES FOR ACADEMIC JOURNALS

### A. International Journals

- (1) Journal of Computational Physics
- (2) Journal of Sound and Vibration
- (3) Journal of American Institute of Aeronautics and Astronautics
- (4) Journal of Fluid and Structure
- (5) Journal of Fluid Dynamics Research
- (6) Journal of the American Helicopter Society

## 10. SUPERVISION OF GRADUATE STUDENTS

### A. MASTER OF SCIENCE

- (1) H. B. Cha MS The design of low-noise, low-turbulence acoustic wind tunnel, 1995
- (2) T. H. Cho MS A study on flow noise induced by surface pressure fluctuations on the flat plate, 1995
- (3) J. W. Kim MS Development of compact finite difference schemes optimized for computational Aeroacoustics, 1996
- (4) H. J. Kang MS A numerical study on the generation and propagation of exhaust noise in the reciprocating engine, 1996
- (5) J. H. Lee MS Euler computation of helicopter flowfield using a dynamic mesh method, 1996
- (6) D. S. Hwang MS An Analysis of propagation and radiation of axisymmetric duct by using finite element method, 1997
- (7) Y. S. Kim MS A Numerical study on the generation, propagation and radiation of intake noise in the reciprocating engine, 1997
- (8) K. H. Chung MS An analysis of articulated non-linear rotor dynamics coupled with time marching free wake, 1998
- (9) I. B. Shim MS A numerical study on the sound radiation from aircraft engine inlet using optimized compact scheme, 1998
- (10) D. N. Heo MS A study on preconditioning matrix and turbulent model for optimized compact scheme, 1999
- (11) N. S. Park MS A study on characteristics of implicit optimized compact scheme, 1999
- (12) H. L. Choi MS study for the reconstruction of free field sound source from the measured data in a closed wall by using Boundary Element Method, 2000
- (13) W. J. Jeon MS Formulation of single integral equation for a three-part mixed boundary value problem, 2000
- (14) S. J. Han MS Numerical Simulation of the Noise Generation in an

- Axisymmetric Whistle, 2001
- (15) Y. J. Kim MS Study on Optimized Compact Finite Volume Scheme, 2001
- (16) K. Y. Kim MS Prediction of turbulent boundary layer broadband noise from a rotor, 2002
- (17) B. S. Kim MS A study on the interaction between rotor wake and fuselage, 2002
- (18) I. C. Lee MS An analysis of screech tone noise from supersonic jet using optimized compact scheme, 2003
- (19) S. K. Lee MS Aerodynamic analysis of rotor blades and ducted fan using improved panel and time-marching free wake coupling method, 2004
- (20) B. J. Kim MS Development of axial fan design program considering performance and noise, 2004
- (21) S. K. Kang MS Development of fan performance analysis method considering system resistance, 2004
- (22) K. H. Baik MS Parallel vortex airfoil interaction with trailing edge flap at low speed, 2005
- (23) S.Y. Wie MS Numerical Investigation about Blade Vortex Interaction using Free wake method and Vortex embedded method, 2006
- (24) J. S. Jang MS Development of Unsteady Rotor Hover Test Rig URHoT with Partially Inclined Ground, 2008
- (25) L. Zhao MS Effects of Wing Placement on Transition, Boundary Layer Displacement Thickness and Broadband Noise, 2008
- (26) S. H. Park MS Development of Coupled 2-D Panel / Euler Solver for Numerical Analysis of Transonic Flow, 2011
- (27) J. A. Jeun MS A Study on Scattering of Acoustic Sources by a Circular Cylinder Using the Fast Multipole Boundary Element, 2012
- (28) J. H. Jun MS A Study on the Main Rotor Wake Configuration during Hovering and Vertical Maneuver Flight, 2013
- (29) Y. B. Chu MS A Study on Aerodynamic and Dynamic Characteristics of Helicopter during Hovering Turn Maneuver Flight, 2014
- (30) H. T. Park MS Analysis of Flight Effects on Supersonic Screech Jet Tones using High-Order High-Resolution Scheme, 2014
- (31) M. H. Ahn MS Development of High Order and High Resolution Schemes



## **B. DOCTOR OF PHILOSOPHY**

- (1) C. J. Hwang Ph.D. Time domain analysis of nonlinear acoustic wave radiations and reductions using an upwind finite difference scheme for Euler equation, 1995
- (2) J. H. Park Ph.D. Numerical study for the vortex-wedge interaction, 1995
- (3) S. O. Koo Ph.D. Numerical study of acoustic fields generated by unsteady vortical flows, 1995
- (4) K. D. Ih Ph.D. Development of the direct acoustic boundary element method for thin-bodies with general boundary conditions, 1996
- (5) K. W. Ryu Ph.D. Numerical study on the unsteady vortical flow and the acoustic fields induced by the interaction of three-dimensional vortex rings, 1997
- (6) D. K. Ko Ph.D. Development of high resolution and high order schemes for linear and nonlinear wave equations, 1997
- (7) S. U. Na Ph.D. Development of a time-marching free-wake method for the prediction of helicopter rotor wake geometry and performance, 1998
- (8) W. H. Jeon Ph.D. An analysis of noise generation and radiation from centrifugal fans with a casing, 1999
- (9) J. W. Kim Ph.D. High-order and high-resolution schemes with generalized characteristic boundary conditions for computational aeroacoustics of unsteady compressible flows, 2000
- (10) C. M. Chung Ph.D. Numerical Analysis of Flow Fields and Noise for Multiple Circular Cylinders by FEM, 2001
- (11) Y. S. Kim Ph.D. Analysis of radiated noise from internal duct flow and external jet using high-resolution schemes, 2001
- (12) I. J. Chung Ph.D. Prediction for Onset of Transonic Shock Buffet Using Steady Thin-Layer Navier-Stokes Solver, 2002
- (13) I. B. Shim Ph.D. An analysis of sound radiation from curved intake in transonic flow field, 2003

- (14) K. H. Chung Ph.D. Identification and active control of rotor wake instability, 2003
- (15) D. N. Heo Ph.D. Numerical study on the feedback mechanism of flow and acoustic wave in an open cavity, 2004
- (16) H. L. Choi Ph.D. Radiation from a Rotating Dipole Source in a Finite Elastic Thin Duct, 2006
- (17) W. J. Jeon . Ph.D. An Analytic Study of Acoustic Diffraction by a Finite Strip in Convected Medium, 2007
- (18) G. Y. Kim . Ph.D. A Study on the Prediction Method of Shroud Fan Broadband Noise, 2008
- (19) I.C. Lee Ph.D An analysis of mechanism of supersonic screech tone noise using high order high resolution numerical scheme, 2008
- (20) S. Y. Wie Ph.D N-S and panel Coupled Rotor Aerodynamics, 2009
- (21) T. H. Cho Ph.D On the correction method for the pre-stall aerodynamic performance of the scaled wind turbine model blade and the measurement method for the aero-acoustic noise source in the wind tunnel, 2010
- (22) Y. N. Kim Ph.D Development of numerical method for resonant flow generated by interaction between fluid flow and acoustic resonance, 2012
- (23) J. S. Jang Ph.D Development of Prediction Method for Body Surface Pressure due to Rotor Wakes by using Poisson Integral Equation, 2013
- (24) C. H. Cho Ph.D Investigation of characteristics of nonlinear propagation and nonlinear impedance in resonant acoustic liners with no mean flow, 2013
- (25) Y. W. Lee Ph.D A Study on Boundary Element Methods in time and frequency domains for rotating aeroacoustic sources in a uniform flow, 2014

## 11. LIST OF CO-OPERATIVE ORGANIZATIONS

1. KIST: Wind tunnel design (1990)

2. KOSEF/NRF: Fast-Vortex method (1992), Noise of Rotor-craft plane (1990-1993), High order High resolution Compact scheme (1996-1997), Flow and Noise feedback (1999-2000), Axil Fan (1998-2004), Smart wing (2011-2014), Helicopter (2013-2015), Space launch vehicle noise (2014-2019)
3. ADD: Radar Signature (1990-1991), Transonic & Supersonic vehicle (1990-1992), Flow analysis method (1992-1993), Flutter analysis (1994), Flow-noise analysis(1994-1996), Drag reduction technique (1995-1996), Stealth (1996-1998), Turbulent flow noise (1996-1997), Moving grid (2002-2003), Blast noise (2003-2005), Helicopter maneuver (2011), Portable guided missile noise (2013-2014)
4. KARI: Hingeless rotor (2001-2003), Helicopter tail Fan-ducted noise (2001-2004), Air vehicle Propeller (2002-2003), NARO rocket noise (2010), Helicopter accident (2012)
5. Samsung Electronics: Low noise centrifugal fan (1993-1994), Refrigerator fan (1995-1996), CD-Rom drive noise (1999-2000), High efficiency fan design (2002-2003)
6. LG Electronics: Sound source of Fan system (1999-2000), Cross flow fan (2001-2002), Low noise PDP TV (2002), Centrifugal fan noise (2011)
7. Daewoo Heavy Industries Co.: Coaxial Helicopter (1995-1996)
8. Samsung Heavy Industries Co.: Heavy equipment cooling noise (1996), Boiler noise (1996-1997)
9. Hyundai Heavy Industries Co.: Motor cooling fan (2001-2002)
10. Hyundai Motor Co.: HVAC noise (1997-1998), Low noise HVAC considering sound quality (2003-2004)
11. KIMM: Fan-system noise (1999-2000)
12. KISTEP: 3D Aero-acoustic analysis program (1999-2000), Fan-flow noise software (2001-2002), Rocket-Jet noise (2003-2004)
13. MOST: Active-noise control (2002-2003), Rocket-Jet noise (2002-2003)
14. KWRC: Dehydrator noise (2003)
15. KEPC: Power transmission cable noise (1998-1999)
16. Boeing: Supersonic Wave in Turbo-Fan Engine (2007)
17. GM Asia: Turbo charger noise (2009-2011)
19. LIG-Nex1: Jet noise
20. KAI: Open rotor noise (2010), Mid-size airplane noise (2011)
21. Halla Climate Control: Axial cooling fan noise (2012)
22. KAIST EEWS: Open rotor (2010-2013), Offshore wind turbine (2012)