JUNGHYUN (ANDY) KIM

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RESEARCH INTERESTS

Machine Learning, Optimization, Operations Research, Air Traffic Management, Environmental Impacts on Civil Aviation, Computational Fluid Dynamics

EDUCATION

Georgia Institute of Technology

Ph.D. Candidate in Computational Science and Engineering (2018.05 – 2021.05)

- Advisor: Dimitri N. Mavris
- Thesis: Data-driven approach using Machine learning for real-time flight path optimization

Georgia Institute of Technology

M.S. in Aerospace Engineering (2015.08 – 2018.05)

- Advisor: Dimitri N. Mavris
- Thesis: Multi-objective optimization of departure procedures at Gimpo international airport

Seoul National University (2012.02 – 2013.12)

M.S. in Aerospace Engineering

- Advisor: Kyuhong Kim
- Thesis: Development and verification of density-based solver using LU-SGS algorithm in OpenFOAM

Sejong University (2005.03 – 2012.01)

B.S. in Aerospace Engineering

- Advisor: Jon Ahn
- Graduated with honors: Summa Cum Laude

EMPLOYMENT

CJ Logistics

Research Intern (2018.05 – 2018.07)

- Conducted surrogate-based optimization using Artificial Neural Network and Transportation Problem algorithm
- Conducted uncertainty analysis with respect to supply, hub capacity, and truck speed

SIEMENS

Research Intern (2016.05 – 2016.07)

- Designed the nozzle for Surface-to-Air Missile and analyzed the nozzle flow using STAR-CCM+

- Improved transition models in STAR-CCM+

Korea Aerospace Research Institute (KARI)

Full-time Researcher (2014.01 – 2015.07)

- Developed Korean Multi-Purpose Satellite 3A (KOMPSAT-3A)
- Participated in launch campaign in Russia (Successfully launched in 2015)
- Designed shipping container for transportation of the KOMPSAT-3A to launch site

Aerospace Systems Design Laboratory (ASDL)

Graduate Research Assistant (2016.01 – 2019.07)

- Developed real-time flight route optimization framework (ASDL Airspace research project)
- Conducted parametric uncertainty and sensitivity analysis of environmental impacts from aviation (FAA project)
- Conducted takeoff/climb analysis to support AEDT APM development (FAA project)
- Conducted manufacturing influenced design on Unmanned Aerial Vehicle (Boeing project)

School of Aerospace Engineering, Georgia Institute of Technology

Graduate Teaching Assistant (2019.08 – 2020.05)

- Assisted in teaching aircraft design to students

School of Mechanical Engineering, University of Alberta

Research Intern (2012.12 – 2013.02)

- Conducted a computational study of a circular cylinder at Low Reynolds number for open loop control of Von Karman vortex shedding

FELLOWSHIPS

Korean Government Overseas Fellowship

US$ 40,000 per year, for 2 years (2015.08 ~ 2017.08)

Korea Aerospace Industry (KAI) Graduate Research Fellowship

US$ 12,000 per year, for 2 years (2012.03 ~ 2014.03)

LG Display Graduate Research Fellowship

US$ 20,000 per year, for 2 years (2019.05 ~ 2021.05)

Hyundai Motors Graduate Research Fellowship

US$ 24,000 per year, for 1.5 years (2020.01 ~ 2021.05)

PUBLICATIONS

Conference Papers

[10] **Junghyun Kim**, Simon I. Briceno, and Dimitri N. Mavris, “Data-Driven Approach using Machine Learning to Enable Real-time Flight Path Planning”, AIAA Aviation, June 2020 (Under review)

[9] **Junghyun Kim**, Kisun Song, Seulki Kim, and Dimitri N. Mavris, “Data-Driven Approach for Understanding the Impact of Weather on Commercial Flight Path”, AIAA Aviation, June 2019

[8] **Junghyun Kim**, Kisun Song, Seulki Kim, Yongchang Li, and Dimitri N. Mavris, "Aircraft Mission Analysis Enhancement by using Data Science and Machine Learning Techniques", AIAA Aviation, June 2019

[7] **Junghyun Kim**, Kisun Song, Changyun Chung, and Dimitri N. Mavris, "A Surrogate-based Optimizatin for a Mega-Hub location problem in South Korea using Aritifical Neural Network", IISE, May 2019

[6] Kisun Song, Kyunghak Choo, **Junghyun Kim**, and Dimitri N. Mavris, "Multi-objective Decision Making of a Simplified Car Body Shape Towards Optimum Aerodynamic Performance", ASME, August 2017

[5] Kisun Song, Kyunghak Choo, **Junghyun Kim**, and Dimitri N. Mavris, "Aerodynamic Automobile Shape Optimization by Incorporating Reverse Shape Design Method with CFD analysis", ASME, August 2017

[4] **Junghyun Kim** and Kyuhong Kim, "A Development and Verification of Density-based Solver Using LU-SGS Algorithm in OpenFOAM", ICAS, September 2014

[3] **Junghyun Kim**, Choonwoo Lee, Seungbin Lim, Sanghoon Lee, and Seokwon Choi, "A Study on the Environment of Shipping Container designed for Transportation of the Low Earth Orbit Satellite to Launch Site", KSAS, April 2014

[2] **Junghyun Kim**, Kyuhong Kim, and Jon Ahn, "A Computational Study on the Design of Airfoils for a Fixed Wing MAV and the Aerodynamic characteristic of the vehicle", ICAS, September 2012

[1] **Junghyun Kim**, Taekyung Kim, Joongkeun Choi, and Kyuhong Kim, "A Computational Study on the Flow Control and the Aerodynamic Characteristic of the Railway carriage by using Air Blowing", KSR, May 2012

Journal Articles

[2] **Junghyun Kim**, Simon I. Briceno, and Dimitri N. Mavris, "Data-Driven Approach using Machine Learning for Real-time Flight Path Optimization", Journal of Aerospace Information Systems, 2020 (On-going)

[1] **Junghyun Kim**, Dongwook Lim, Dylan Jonathan Monteiro, Michelle Kirby, and Dimitri N. Mavris, "Multi-objective Optimization of Departure Procedures at Gimpo International Airport", International Journal of Aeronautical and Space Sciences, March 2018

Poster and Workshop Papers

[2] Sungil Hong, **Junghyun Kim**, and Eunhwa Yang, "Improving Facility Management Performance by Optimizing Work Order Assignment with Genetic Algorithm", Conference of Computational Interdisciplinary Science, March 2019

[1] **Junghyun Kim**, C.F. Lange, and C.R. Koch, "A Computational Study of a Circular Cylinder at Low Reynolds Number for Open Loop Control of Von Karman Vortex Shedding", International OpenFOAM workshop, June 2013

HACKATHON EXPERIENCE

Boeing Innovation Challenge Hackathon

Selected as finalist (January 2019)

- Pitched the idea with state-of-art Machine learning and optimization techniques to improve demand and supply forecasting for aircraft components (https://www.boeing.com/company/about-bca/washington/innovation-challenge-02-08-19.page)

Chick-fil-A Technology Innovation Hackathon

Won the first place (November 2018)

- Pitched the basic idea with computer vision and Operations Research skills to improve not only customer service but internal operations by providing average waiting time for Drive-thru and Dine-in

AWARDS & HONORS

Best Presentation Winner

Won the most excellent achievement in Hyundai Motor global top talent forum (August 2019)

Won the best presentation winner in KSR (May 2012)

Best Paper Award

Won the best paper award in KAI student research competition (November 2017)

Won the first place in the outstanding technical paper award in SAMPE (May 2017)

Seoul National University Scholarship

Won merit-based scholarship for one semester (Spring 2013)

Graduate Teaching Assistant of the Year

Selected as the best graduate teaching assistant in the school of Aerospace engineering in Seoul National University (Fall 2012)

Finalist to Aircraft design competition

Placed 2nd in Human Powered Aircraft Design Challenge by Korea Aerospace Research Institute (October 2012)

Sejong University Scholarship

Won honors scholarship for three semesters (Fall 2010, Spring 2011, and Fall 2011)

INVITED TALKS

Data-driven approach for real-time flight trajectory management analysis

Hyundai Global Top Talent Forum, San Diego, United States (August 2019)

Surrogate-based Optimization with Machine learning techniques

LG Technology Conference, San Francisco, United States (April 2019)

Operations Research application on Road maintenance

Korean-American Scientists and Engineers Association, Washington D.C., United States (October 2018)

Research on Environmental Impacts from Civil Aviation

Pusan National University, Busan, South Korea (July 2018)

WECPNL Noise validation on Gimpo International Airport

Seoul Metropolitan Government, Gimpo, South Korea (October 2017)

How to prepare Study-abroad

Hackers Academy, Seoul, South Korea

https://www.youtube.com/watch?v=bsLEyUYjkuk (May 2015)

https://www.youtube.com/watch?v=WMEuC4strkI (May 2016)

TEACHING EXPERIENCE

Teaching Assistant

Aircraft design, Georgia Institute of Technology (Fall 2019)

Marketing, Seoul National University (Summer 2013)

Korean, University of Alberta (Spring 2013)

Fluid Dynamics, Seoul National University (Fall 2012)

Aircraft Propulsion, Sejong University (Spring 2011)

PROFESSIONAL MEMBERSHIP

Aerospace Engineering

International Student Educational Board (ISEB)

American Institute of Aeronautical and Astronautical (AIAA)

Industrial and System Engineering

Institute of Industrial and Systems Engineers (IISE)

Last updated: December 16, 2019