



The 25th HU and SNU Joint Symposium
Joint Symposium in the fields of Mechanical
and Aerospace Engineering

November 10-11, 2022

Program & Abstracts



Department of Aerospace
Engineering & Department of
Mechanical Engineering,
Seoul National University (SNU),
Korea



Department of Mechanical and
Intelligent System Engineering,
Faculty, Graduate School and
School of Engineering,
Hokkaido University (HU),
Japan



융복합지식기반 창의혁신적 항공우주인재 양성사업단
BK21 Interdisciplinary Knowledge based Training Program for Creative and Innovative Aerospace Engineers

Date: Thursday, November 10-11, 2022

Venue: SNU Faculty Club Conference hall 9

Co- Chairs: Kwanjung Yee, Professor, Seoul National University
OSHIMA Nobuyuki, Professor, Hokkaido University

Day 1(Nov. 10)

09:30 – 10:00 Opening Remarks

Kwanjung Yee, SNU

OSHIMA Nobuyuki, HU

Welcome address

Yoo Suk Hong, Dean, College of Engineering, SNU

10:00 – 12:00 Session 1: AI, Robotics and Materials (30 min/paper)

Chair: FUJIMURA Nao

1. MR-compatible haptic device for MR-guided needle intervention
Amy Kyungwon Han, SNU
2. Safe trajectory generation for autonomous flight vehicles
Hyeonjin Kim, SNU
3. Surface modification of magnesium alloy via scanning cyclic press
FUJIMURA Nao, HU
4. Robust Localization and Mapping in Real-world Robotics
Ayoung Kim, SNU

12:00 – 14:00 Lunch

14:00 – 15:30 Session 2: Future Mobility (30 min/paper)

Chair: OSHIMA Nobuyuki

1. Introduction to SNU ERC on UAM
Sangjoon Shin, SNU
2. Precision form measurement of an optical component with a femtosecond laser angle sensor
SHIMIZU Yuki, HU
3. Improvement of oxygen transport characteristics for high power lithium-air battery
UEMURA Suguru, HU

15:30 – 16:30 Coffee Break

16:30 – 17:30 Poster Session (12 papers)

19:40 – 21:00 Welcome Reception (Convention Hall, SNU Faculty club)

Day 2(Nov. 11)

10:00 – 12:00 Session 3: Next Generation Aerospace Technology (30 min/paper)

Chair: Kybeom Kown

1. Multiscale process simulation for reactive high deposition rate metal 3D printing
Gunjin Yoon, SNU
2. Development of evaluation method for material flammability in spacecraft environment
Konno Yusuke, HU
3. Numerical and experimental investigations of Field Emission Electric Propulsion
Kybeom Kown, Jai-ick Yoh, SNU
4. Numerical and Experimental Advancements in the Development of a Regenerative Cooling System for Hybrid Rocket Applications
Giuseppe Gallo, HU

12:00 – 13:00 Lunch

13:00 – 14:00 Open Discussion Towards Future Joint Symposium

14:00 – 15:00 Session 4: Nano & Bio (30 min/paper)

Chair: Jungwon Park

1. Biomechanical study on biomimetically mineralized collagen matrix for bone scaffold
TODOH Masahiro, HU
2. Colloidal nanoparticle dynamics investigated by liquid phase electron microscopy
Jungwon Park, SNU

15:00 – 15:30 Closing Remarks

Kwanjung Yee, SNU

OSHIMA Nobuyuki, HU

Graduate Student Poster Session

- HU-1 Fluid Structure Interaction of the Flutter and Limit Cycle Oscillations of a Cropped Delta Wing in Transonic Regime
Langa Sheila, Balaji Vidyut, Takahashi Yusuke
sheilachicafrancisco.langa.b0@elms.hokudai.ac.jp
- HU-2 Coupled Aeroelastic and Aerodynamic Study of Inflatable Aeroshell in Transonic Flow
Sanjoy Kumar Saha and Yusuke Takahashi
sanjoykumar.saha.p7@elms.hokudai.ac.jp
- HU-3 Aerodynamic Instability with Pitching Motion of Thin Shell Type Reentry Capsule at Transonic Speed
Hideto Takasawa, Tomoya Fujii, Koshiro Hirata, Takahiro Moriyoshi, Yusuke Takahashi, Yasunori Nagata, Kazuhiko Yamada
thide3224@eis.hokudai.ac.jp
- HU-4 Study on Communication Blackout Mitigation by Gas Injection Using Large-scale Arc Heated Wind Tunnel
Takashi Miyashita, Yuji Sugihara, Yusuke Takahashi
myshttksh@eis.hokudai.ac.jp
- HU-5 Effect of articular surface morphology on frictional resistance of sacroiliac joints
Ryota Toyohara, Toshiro Ohashi
toyohara.rt@gmail.com.
- HU-6 Engineering Center for Systems Engineering Education
Harunori NAGATA, Masaharu UCHIUMI, Yuichi MURAI, Yuji SAKAMOTO, Ryoji IMAI
nagata@eng.hokudai.ac.jp
- SNU-1 Effect of ion-wall recombination on the performance of Hall thrusters
Seongil Seo, Kybeom Kwon, and Bok Jik Lee
- SNU-2 A Numerical Study of the Effects of Fractal Geometry on Reacting and Nonreacting Flows in a Low-Swirl Burner
Byoungjoo Chun, Jongkwon Lee, and Bok Jik Lee
- SNU-3 Evaluation of snow accumulation simulation on a train using experimental results
Soonho Shon, Wan Gu Ji, Yu-Eop Kang, and Kwanjung Yee
- SNU-4 Improvement of Design Methodology for eVTOL Aircraft: Aerodynamic Correction and Physics-based Weight Estimation Modeling
Jueun Seo, Donguk Lee, and Kwanjung Yee
- SNU-5 A Study on the Optimal Trajectory Analysis for the Earth Reentry Spaceplane TPS Development
Dohoon Kim, Dabin Han, Hoonjung Yeo, Gi-Hyuk Choi, and Kyu Hong Kim
- SNU-6 Prediction of Aerodynamic Heating Over Hypersonic Flow Using Empirical Correlations
H.Yeo, D.Han, D.Kim, S.Seo and Kyu Hong Kim