MOROKOT SAKAL

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Sangkat Kilometer 6, Khan Russey Keo, Phnom Penh, Cambodia
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EDUCATION

Tohoku University Sendai, Japan
Graduate School of Engineering, Department of Aerospace Engineering Apr 2018 – Mar 2020
M. Eng., Aerospace Engineering
- Advisor: Prof. Toshinori Kuwahara
- Thesis: System Integration of Science Handling Unit of Microsatellite RISESAT based on Plug-and-Play Technology

Tohoku University Sendai, Japan
School of Engineering, Department of Mechanical and Aerospace Engineering Apr 2016 – Mar 2018
B. Eng., Mechanical Engineering
- Advisor: Prof. Tetsushi Biwa
- Thesis: Multi-stage Thermoacoustic Oscillator Using Peltier Device

National Institute of Technology, Ibaraki College Ibaraki, Japan
Department Mechanical and Systems Engineering Apr 2013 – Mar 2016
A. Eng., Mechanical Engineering

RESEARCH EXPERIENCE

1U CubeSat Project - Apsara-1 Phnom Penh, Cambodia
Project Coordinator Dec 2020 – Jul 2021
- Led the concept design phase of 1U CubeSat "Apsara-1" (definition of the mission objective, component selection, and the verification method).
- Responsible for the design of the communication subsystem, structure subsystem, and ground segment.
- Co-written the Apsara-1 CubeSat design specification and submitted the application form to the 6th round KiboCube launch opportunity.
- Related Publications: (J2), (J3), (C2), (C3)

Space Robotics Laboratory, Tohoku University Sendai, Japan
Satellite Embedded Software Engineer Apr 2018 – Mar 2020
- Participated in the software design, development and test of the Science Handling Unit of microsatellite **RISESAT**: a 50-kg class Earth-observation satellite, launched in January 2019.
- Participated in defining system level requirement, interfaces, concept of operations and test plans of **IHI-SAT**: a 3U CubeSat for demonstrating the AIS receiver technology, launched in January 2022.
- Related Publications: (J4), (J5), (J6), (C4), (C5), (C6)

GRANTS & AWARDS

Grants
Travel Grant for International Robotics Competition Nov 2022
- Competition: World Robotics Olympiad 2022, Future Innovator, Senior Category, Dortmund, Germany
- Funding Source: CBRD Fund of the Ministry of Post and Telecommunications and WRO Association
- Award amount: $10,360 USD + $1,695 USD

Travel Grant for International Conference Sep 2022

- Conference: International Astronautical Congress (IAC) 2023, Paris, France
- Funding Source: CBRD Fund of the Ministry of Post and Telecommunications
- Award amount: $2,320 USD

Awards

- SATO YO International Scholarship for Master's Degree — Apr 2018 – Mar 2020
- MEXT Scholarship 2016 for Bachelor's Degree (2-year extension) — Apr 2016 – Mar 2018
- MEXT Scholarship 2012 for Associate's Degree — Apr 2012 – Mar 2016
- Cambodian Government Scholarship — Oct 2010 – Mar 2012

SELECTED PUBLICATIONS

Journal Papers

2023	(J1)	R. Corrado, M. Berthet, and **M. Sakal**, "Starlink for ASEAN: A Changemaker in the Race Toward Sustainable Development?," *Space Policy*, p. 101554, May 2023, doi: 10.1016/j.spacepol.2023.101554.
2021	(J2)	P. Srean, **M. Sakal**, M. Berthet, and S. Srang, "Development of Orbital Simulator for Cambodian CubeSat Mission in LEO," *Techno-Science Research Journal*, vol. 9, no. 2, pp. 53-60, 2021.
	(J3)	D. Soun, **M. Sakal**, S. Hokly, and S. Sarot, "Design and Implementation of the Commercial Off-the-shelf Electrical Power System for the Satellite Training Kit -Demosat," *Techno-Science Research Journal*, vol. 9, no. 1, pp. 55–62, 2021.
	(J4)	**M. Sakal** et al. "Integration and Orbit Demonstration of Micro-satellite Payload System Based on a Plug-and-Play On-board Computer", *TRANSACTIONS OF THE JAPAN SOCIETY FOR AERONAUTICAL AND SPACE SCIENCES, AEROSPACE TECHNOLOGY JAPAN 19*, no. 5 (2021): 784-793.
2020	(J5)	K. Junichi, T. Kuwahara, S. Fujita, Y. Sato, K. Hanyu, **M. Sakal**, et al. "A High Spatial Resolution Multispectral Sensor on the RISESAT Microsatellite." *TRANSACTIONS OF THE JAPAN SOCIETY FOR AERONAUTICAL AND SPACE SCIENCES, AEROSPACE TECHNOLOGY JAPAN 18*, no. 5 (2020): 186-191.
2019	(J6)	R. Filgas, M. Malich, T. Kuwahara, J. Broulím, M. Holík, **M. Sakal**, et al. "RISEPix—A Timepix based radiation monitor telescope onboard the RISESAT satellite." *Astronomische Nachrichten 340*, no. 7 (2019): 674-680.

Conference Papers

2022	(C1)	**M. Sakal**, M. Berthet, and R. Corrado "Starlink for ASEAN: can it be the changemaker in the race toward SDGs?," *73rd International Astronautical Congress (IAC)*, 2022, Paris, France, August 2022.
2021	(C2)	M. Berthet, **M. Sakal**, et al. "International Collaboration Towards Cambodia's First Small Satellite Education Program: Lessons Learnt", *Small Satellite Conference*, Paper SSC21-WKI-01, Utah, USA, August 2021.

2020

(C3) M. Berthet, Q. Verspieren, G. Coral, R. Takahashi, N. Funabiki, S. Srang, H. Tim, and **M. Sakal**. "Student-Led Policy and Technical Capacity Building Program: The Road to Cambodia's First CubeSat," *71st International Astronautical Congress (IAC)*, 2020, France.

(C4) Y. Murata, Y. Sato, **M. Sakal** et al. "Ground Evaluation of the Attitude Control System of 3U-CubeSat IHI-SAT," *2020 IEEE/SICE International Symposium on System Integration (SII) (SII 2020*), Honolulu, USA, 12-15 Jan 2020.

2019

(C5) H. Tomio, **M. Sakal** et al. "Lessons Learned from Integrating the Dual-band Optical Transient Camera to Microsatellite RISESAT," *Proceedings of the 12th IAA Symposium on Small Satellites for Earth Observation*, Berlin, Germany, 06-10 May 2019.

(C6) H. Tomio, T. Kuwahara, S. Fujita, Y. Sato, **M. Sakal**, et al. "Assembly and integration of optical downlink terminal VSOTA on microsatellite RISESAT." *In International Conference on Space Optics—ICSO 2018*, vol. 11180, p. 111805Z. International Society for Optics and Photonics, 2019.

EMPLOYMENT HISTORY

American University of Phnom Penh (AUPP) Phnom Penh, Cambodia
Lecturer Jun 2021 – Present

- Lecturer in the Faculty of Information Technology.

AUPP High School - Foxcroft Academy (AUPPHS-FA) Phnom Penh, Cambodia
Adjunct Lecturer Jun 2021 – Present

- Teacher of Robotics class (as part of the STEAM Program).
- Lab manager of the AUPPHS MakerSpace.

Ministry of Post and Telecommunication of Cambodia (MPTC) Phnom Penh, Cambodia
Technical Advisor Jun 2021 – Aug 2022

- Conduct research on satellite applications for Cambodia in cooperation with the Satellite Policy Department.

Research and Innovation Center, Institute of Technology of Cambodia Phnom Penh, Cambodia
Researcher Apr 2020 – May 2021

- Researcher at the Dynamics and Control Laboratory (DCLab).
- Leader of DCLab's Satellite Research Group.
- Supervised four bachelor students and co-supervised three master students on the final-year research projects.

Paragon International University Phnom Penh, Cambodia
Adjunct Lecturer Nov 2020 – Apr 2021

Lecturer for the Physics-I (undergraduate course).

TEACHING EXPERIENCE

- Hours of teaching: **684**
- Number of classes: **11**
- Number of students: **341**

AUPP & AUPPHS-FA

- ITM350 - Project Management Jan 2023 - Present

- ITEC101 - Introduction to Information Technology Aug 2021 – Present
- Robotics

Paragon International University Nov 2020 – Apr 2021
- Physics I – Mechanics, Paragon IU

Institute of Technology of Cambodia Aug 2020 – Feb 2021
- Using Git/GitHub for Version Control, ITC
- Basic of Circuitry/Arduino, ITC

Guest Lectures
1. Science Museum Space Seminar Season 2 - Lessons Learned from Coordinating a Small Satellite Project in Cambodia, January 2023.
2. AUPP Pro Insight – Introduction Small Satellites and Their Applications, March 2022.
3. AUPP ICT Summer Short Courses – Introduction to Robotics, August 2021.

MENTORING EXPERIENCE

World Robotics Olympiad 2022 Mentor Mar 2022 – Nov 2022
- Mentored high school robotics teams to participate in the World Robotics Olympiad 2022, national round in Phnom Penh, Cambodia and the international round in Dortmund, Germany.
- The team won **3rd place** in the national round.

International Space Challenge 2022 Mentor Aug 2021 – Feb 2022
- Recruited a team consisting of four students from four different Universities.
- The team won the "**Distinction Award**" for the proposal of 12U CubeSat named "Reahou-Sat".

Cambodia Robotics Competition 2021 Mentor May 2020 – Jun 2021
- Mentored university robotics teams to participate in the national and international robotics competition.
- The team won **1st place** in the national Robotics competition in 2021 and won the "**Best Design Award**" for the ABU International Robotics Competition 2021.

OTHER ACTIVITIES

Volunteer
Kampuchea Aerospace Exploration Aspiration (KAXA) Jul 2022 – Present
- Director of KAXA, overseeing operations and strategic direction.
- Develop and implement training courses for team members, including Project Management and Research.
- Lead planning and organization of annual activities, including Space 101 Content Creation, Space Engineering Webinars, and the production of KAXA Annual Report.

CERTIFICATION & PROFESSIONAL DEVELOPMENT

Google Project Management: Specialization Jan 2023
Issuing Organization: Coursera
Certification ID: REK2ZYWBQ9ZG

Spacecraft Dynamics and Control Specialization Mar 2022
Issuing Organization: Coursera
Certification ID: UJRBQ2NA3S9P

SKILLS

Languages
Khmer (native), English (professional), and Japanese (professional).

Software & Hardware
- Programming: C, C++, Python, Matlab
- Engineering: Solidworks, Soldering, 3D Printing, Linux, and Git.
- Hardware: Arduino, microbit and PIC Microcontroller

REFEREES
Available Upon Request