

MOROKOT SAKAL

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

Tohoku University

Graduate School of Engineering, Department of Aerospace Engineering
M. Eng., Aerospace Engineering

Sendai, Japan

Apr 2018 – Mar 2020

- Advisor: Prof. Toshinori Kuwahara
- Thesis: System Integration of Science Handling Unit of Microsatellite RISESAT based on Plug-and-Play Technology

Tohoku University

School of Engineering, Department of Mechanical and Aerospace Engineering
B. Eng., Mechanical Engineering

Sendai, Japan

Apr 2016 – Mar 2018

- Advisor: Prof. Tetsushi Biwa
- Thesis: Multi-stage Thermoacoustic Oscillator Using Peltier Device

National Institute of Technology, Ibaraki College

Department Mechanical and Systems Engineering
A. Eng., Mechanical Engineering

Ibaraki, Japan

Apr 2013 – Mar 2016

RESEARCH EXPERIENCE

1U CubeSat Project - Apsara-1

Project Coordinator

Phnom Penh, Cambodia

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

Satellite Embedded Software Engineer

Sendai, Japan

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

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| • 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

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| 2023 | (J1) | R. Corrado, M. Berthet, and M. Sakal , "Starlink for ASEAN: A Changemaker in the Race Toward Sustainable Development?," <i>Space Policy</i> , 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," <i>Techno-Science Research Journal</i> , 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," <i>Techno-Science Research Journal</i> , 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", <i>TRANSACTIONS OF THE JAPAN SOCIETY FOR AERONAUTICAL AND SPACE SCIENCES, AEROSPACE TECHNOLOGY JAPAN</i> 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." <i>TRANSACTIONS OF THE JAPAN SOCIETY FOR AERONAUTICAL AND SPACE SCIENCES, AEROSPACE TECHNOLOGY JAPAN</i> 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." <i>Astronomische Nachrichten</i> 340, no. 7 (2019): 674-680. |

Conference Papers

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|------|------|--|
| 2022 | (C1) | M. Sakal , M. Berthet, and R. Corrado "Starlink for ASEAN: can it be the changemaker in the race toward SDGs?," <i>73rd International Astronautical Congress (IAC)</i> , 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", <i>Small Satellite Conference</i> , 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," <i>71st International Astronautical Congress (IAC)</i> , 2020, France. |

	(C4)	Y. Murata, Y. Sato, M. Sakal et al. "Ground Evaluation of the Attitude Control System of 3U-CubeSat IHI-SAT," <i>2020 IEEE/SICE International Symposium on System Integration (SII) (SII 2020)</i> , Honolulu, USA, 12-15 Jan 2020.
	(C5)	H. Tomio, M. Sakal et al. "Lessons Learned from Integrating the Dual-band Optical Transient Camera to Microsatellite RISESAT," <i>Proceedings of the 12th IAA Symposium on Small Satellites for Earth Observation</i> , Berlin, Germany, 06-10 May 2019.
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." <i>In International Conference on Space Optics—ICSO 2018</i> , vol. 11180, p. 111805Z. International Society for Optics and Photonics, 2019.

EMPLOYMENT HISTORY

American University of Phnom Penh (AUPP)

Lecturer

Phnom Penh, Cambodia
Jun 2021 – Present

- Lecturer in the Faculty of Information Technology.

AUPP High School - Foxcroft Academy (AUPPHS-FA)

Adjunct Lecturer

Phnom Penh, Cambodia
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)

Technical Advisor

Phnom Penh, Cambodia
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

Researcher

Phnom Penh, Cambodia
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

Adjunct Lecturer

Phnom Penh, Cambodia
Nov 2020 – Apr 2021

Lecturer for the Physics-I (undergraduate course).

TEACHING & MENTORING EXPERIENCE

Courses Taught

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

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