Elioenai Sitepu, S.T., M.Sc., Ph.D.

Head of Section –Technology Transfer Office, BINUS University

Assistant Professor – Master of Industrial Engineering, BINUS University

Keywords: Automotive, Astronautic, In-Situ Resource Utilisation, Aerospace, Medical Device, Structure, Industrial Design, 3D Modelling, Finite Element Modelling, Discrete Element Modelling, Prototyping, Leadership

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SUMMARY

Elioenai is a adaptable professional at Bina Nusantara University (BINUS University), serving as Head for Research Product & Commercialization (RPC) at Technology Transfer Office and as an assistant professor in the Master of Industrial Engineering program.

Leading the RPC team, he is actively seeking/driving industry/market-driven research by appealing with various industries (healthcare/medical, financial technology, manufacturing industries, etc.) and connects them with relevant researchers across BINUS University. He is also driving the research product from BINUS University to reach market/implementation, assessing required technological improvement and assisting potential funding opportunities. In addition to his role in RPC, He surpassed annual targets of processed Intellectual Property Rights in 2022 & 2023, a significant increase from the previous years, through digitalization and process improvements. Leading the Integrated Digital BINUS Science & Technology Park Phase 1 project under the direct supervision of the Vice Rector of Research & Technology Transfer, Elioenai secured Platinum Funding (2022, 2023, & 2024 ~ IDR 1,361,580,000 ~ USD 83,302), resulting in the launch of BINUS BRIDGE Apps, a digital platform connecting researchers and industries, inaugurated by the Minister of Investment of Indonesia & Rector of BINUS University.

Previously, he contributed to a European Space Agency (ESA)-funded project regarding CubeSat ballistic landing simulation at ZARM Drop Tower while pursuing his Doctoral Degree (Sponsored by Indonesia Endowment Fund for Education Agency) at Cranfield University, UK, on CubeSat missions, in-situ resource utilization, & space system engineering optimization.

He has a range of skills that support his work, including Finite Element Modelling using CATIA, SolidWorks, and Ansys, as well as Discrete Element Modelling with LAMMPS. He is also proficient in Microsoft Office (Word, Excel, PowerPoint) and has experience with micro-controllers like Raspberry Pi and Arduino.

EXPERIENCE

Bina Nusantara University - Jakarta, Indonesia (KPI 2022: 5.48/6 & 2023: 5.39/6)

Head of Section - Research Product & Commercialization, Business & Technological Innovation (April 2021 - present)

- Supervise, increase efficiency of process, of Intellectual Properties Rights (IPR) management, Technology implementation, and Research-based product towards commercialization and empowerment.
- Initiated Digitalization of Property Rights (IPR) Registration (The apps yield significant improvement from previous years).
- Connect with various industries to increase/trigger industry-driven research in Bina Nusantara University.

Project Owner / Manager – Theme: Binus Science & Technology Park Phase 1, Project Initiative Program (November 2021 – present)

- Grant: Platinum funding for three consecutive years, 2022, 2023, and 2024 (a total of IDR 1,361,850,000 ~ USD 83,302).
- 2022: Benchmarked to top-tier Science & Technology Parks in Indonesia and produced blueprint for BINUS Technology Park development.
- 2023: Launched of BINUS BRIDGE Apps (www.binus.ac.id/bridge), a digital infrastructure to elevate researchers, research product, partnership, towards industry-driven aspect (https://www.liputan6.com/citizen6/read/5320573/dorong-pertumbuhan-ekonomi-nasional-binus-university-dan-menteri-investasi-luncurkan-aplikasi-bridge-dan-lakukan-penandatanganan-mou).
- 2023: Continuous enhancement of BRIDGE Apps and promotion to top tier industries & universities.

Assistant Professor (L200) – Master of Industrial Engineering, BINUS Graduate Program (Sep 2022 - present)

- Course Taught:
  - Machine Element Design at Automotive & Robotics Engineering, BINUS ASO School of Engineering. Divide into theoretical and Structural Design Analysis group project (Wheel Design Analysis, Bumper, etc) (Tools: SolidWorks)
  - Industrial System Design & Engineering Optimization at Master of Industrial Engineering, BINUS. (Tools: MiniTab)
  - Research Methodology at Industrial Engineering, BINUS.
  - Research Interest: Astronautics, Automotive, Structural Design Optimization.
- Research Grant:
  - Research Member - Penelitian International BINUS 2023 – Theme: AI-Based in Medical/Health-care Device
  - Research Member - Penelitian International BINUS 2023 – Theme: Food Technology.
  - Research Lead - Technology Readiness Level Development Fund 2023 – Theme: AI-Based Communication System in Transportation (Automotive).
- Supervision:
  - Master Thesis: Warehouse Layout Design Analysis & Optimization to Improve Efficient Logistic of Automotive Industry in Indonesia (2023 – 2024)
  - Master Thesis: Development and Design Optimization of Offshore Wellhead Platform at Oil & Gas Company in Indonesia (2023 – 2024)
  - Undergraduate Thesis: AI-Based Messaging Display for Communication at Automobiles. (2023 – 2024)
  - Undergraduate Thesis: AI-Based, Non-Invasive Early Screening System for Kidney Health Assessment (2022 – 2024)

European Space Agency - Bremen, Germany

Co-Project Manager, Researcher – Team Land3U, Drop Your Thesis 2018 Program (September 2017 – 2019)

- Project: CubeSat Ballistic Landing on an asteroid.
- Conducted concurrently with my Doctoral Program at Cranfield University, UK.

- Led proposal preparation, simulant/material preparation research, and conducted 7 experiments in the ZARM Drop Tower.
- Successfully measured the coefficient of restitution, bridging actual space mission data to prior experiments.

PT. Dirgantara Indonesia (Indonesian Aerospace) - Bandung, Indonesia
Structural Design Engineer (2015 – 2016)

EDUCATION

Cranfield University, United Kingdom (2016 – 2021)
Doctor of Philosophy (Ph.D) in Astronautics & Space Engineering

- Explored CubeSat-compatible payload for In-Situ Resource Utilization (ISRU), focusing on sustainable energy generation from asteroids.
- Studied feasibility of ISRU methods and sample acquisition systems for CubeSat/Spacecraft missions in microgravity.
- Characterized granular sampling from a designed acquisition system/mechanism.
- Employed methods including literature review, trade-off study, 3D design, laboratory experiments, and computer-based simulations.
- Utilized tools such as CATIA, SolidWorks, LAMMPS, Arduino, Raspberry Pi, and IoT.
- Received full scholarship from the Endowment Fund for Education (LPDP).

University of Southampton, United Kingdom (2013 – 2014)
Master of Science in Space System Engineering - GPA 3.2 / 4

- Research Topic: Near Earth Object Observation Simulator
- Group project: Active Space Debris Mitigation System. (3D Design, Simulation & Analysis)

Bandung Institute of Technology, Indonesia (2009 – 2013)
Bachelor of Science in Aerospace Engineering - GPA 3.02 / 4

- Research Topic: Material Characterization for Sandwich Structure of Composite

SKILLS

- Finite Element Modelling (3D Modelling, CATIA, SolidWorks, Ansys)
- Discrete Element Modelling (LAMMMPS)
- Microsoft Office (Word, Excel, Power Point)
- Micro-controller (Raspberry Pi, Arduino)
- MATLAB
- AGI System Tool Kit
- Project Management
- Positive Influencer
- Analytical Thinking
- Problem Solving
- Strong Work Ethic
- Public Speaking
- Communication

Awards/Accomplishments

- Awarded Gold Funding (Team Member), Bridging Industry and Universities for Sustainable Future (BINUS) Indo-Pacific Forum, 2024 from Project Initiative, Yayasan Bina Nusantara
- Awarded Platinum Funding (Team Leader), Elevating BINUS BRIDGE: Linking Pathways to Top-Tier Universities and Industries, 2024 from Project Initiative, Yayasan Bina Nusantara
- Awarded Platinum Funding (Team Leader, Sistem Penghargaan & Monitoring Luaran Penelitian, 2023 from Project Initiative, Yayasan Bina Nusantara
- Awarded Platinum Funding (Team Leader), Integrated-Digital BINUS Science & Technology Park (BSTP), 2022 from Project Initiative, Yayasan Bina Nusantara
- Awardee of the Drop Your Thesis 2018 by The European Space Agency, conducting microgravity research at ZARM Drop Tower, Bremen, Germany.
- Presented papers at the 68th and 69th International Astronautical Congresses in 2018 and 2019 respectively.
- Former President of Cranfield University Basketball Club (2017-2018) and Indonesia Society of University of Southampton (2013-2014).
- Received LPDP PK 49 Scholarship for PhD.

Published Papers / Books

- (*Published*) Journal Article (Q1) Budiman, A.S., Putri, D.N.N., Candra, H., Djuana, E., Sari, T.K., Aji, D.P., Putri, L.R., **Sitepu, E.**, Speaks, D. and Pasang, T., 2024. Crack Catcher AI–Enabling smart fracture mechanics approaches for damage control of thin silicon cells or wafers. Solar Energy Materials and Solar Cells, 273, p.112927.
- (*Published*) Journal Article (Q2) - **Sitepu, E**. and Cullen, D., 2023. Granular Sample Collection Simulation via Counter Rotating Wheels Sampler for Small-Sized System at Reduced Gravity Environment. Planetary & Space Sciences, 237.
- (*Published*) Journal Article (Q1) – Gautier, F., **Sitepu, E**., Le Blay, C., Kersey, G. and Sánchez, J.P., 2020. Drop Your Thesis! 2018 results: 4.74 seconds of microgravity conditions to enable future cubesat landings on asteroids. Acta Astronautica, 176, pp.139-155.
- (*Published*) Conference Paper – **Elioenai, S**. and Cullen, D., 2018. CubeSat 3U-payload for in-situ resource utilisation demonstration at C-type near Earth asteroids, the 68th International Astronautical Congress, 2018, Bremen, Germany
- (*Published*) Conference Paper – Sanchez Cuartielles, J.P., **Sitepu, E.**, Le Blay, C., Kersey, G., Ogborne, S., Durrani, D.A., Zanotti Fragonara, L., Gautier, F. and Kingston, J., Towards drop your thesis 2018: 4.7 seconds of microgravity conditions to enable future CubeSat landings on asteroids, the 68th International Astronautical Congress, 2018, Bremen, Germany
- (*Published*) Book Publication – "Take Down UK" by Inspira Book,.
- (*Preparing - 2024*) Journal Article (Q2) – **Sitepu, E**. and Cullen, D. Title: In-Situ Resource Utilisation for Miniaturised Payload: Oxygen Extraction Methods for Planetary Bodies
- (*Preparing - 2024*) Journal Article (Q2) – **Sitepu, E**. and Cullen, D. Title: Lab-Demonstration of Water Extraction System for Smal-Sized ISRU Payload

Previous Projects Summary

Project Name: Elevating BINUS BRIDGE: Linking Pathways to Top-Tier Universities & Industries - ***Lead***

- *Contract Value: IDR 213,730,000 (~ USD 13,076)*
- *Duration: 2023 - 2024*
- *Client: BINUS (Indonesia & Asean Partners)*
- *Key Project Summary: Creating strategic partnerships towards technology transfer ecosystems.*

Project Name: Bridging Industry and Universities for Sustainable Future (BINUS) Indo-Pacific Forum 2024- Member

- *Contract Value: IDR 1,188,400,000 (~ USD 72,707)*
- *Duration: 2023 - 2024*
- *Client: BINUS, University & Industry Partners (Indonesia & International partners)*
- *Key Project Summary: Fostering strategic partnerships aligned with the SDGs to enhance BINUS Global reputation.*

Project Name: AI-Based in Medical/Healthcare Early Screening Device - Member

- *Contract Value: IDR 55,000,000 (~ USD 3,364)*
- *Duration: 2023 - 2024*
- *Client: BINUS , RS AN-NISA (Indonesia - Hospital)*
- *Key Project Summary: Partnering with hospitals to improve the accuracy of non-invasive early screening devices for kidney health monitoring.*

Project Name: Sistem Penghargaan & Luaran Penelitian - ***Lead***

- *Contract Value: IDR 475,850,000 (~ USD 28,112)*
- *Duration: 2022 - 2023*
- *Client: BINUS (Indonesia)*
- *Key Project Summary: Upgrading internal BINUS applications to monitor and amplify the visibility of research outcomes.*

Project Name: Integrated-Digital BINUS Science & Technology Park (BSTP) - ***Lead***

- *Contract Value: IDR 672,000,000 (~ USD 41,113)*
- *Duration: 2021 - 2022*
- *Client: BINUS (Indonesia & National Partners)*
- *Key Project Summary: Developed the blueprint for BINUS Techno Park and a digital ecosystem (launched: BRIDGE Apps) to foster market-driven and industry-driven research.*

Project Name: CubeSat Ballistic Landing on Asteroid in ZARM Drop Tower - ***Co-Lead***

- *Contract Value: Not specified (Sponsored: All travels, accommodations, expenses, and simulations in the Drop Tower, might equivalent to USD 41,000)*
- *Duration: 2017 - 2018*
- *Client: European Space Agency (Europe)*
- *Key Project Summary: Successfully measured the coefficient of restitution, bridging actual space mission data to prior experiments.*