

Student-Led Graduate Student Research Exchange Program (学生発表会) 報告書

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本報告書は、2026 年 9 月 28 日に九州大学伊都キャンパス (IMI オーディトリウム) およびオンライン (Zoom) のハイブリッド形式で開催された研究発表会「UTM-KU Student-Led Graduate Student Research Exchange Program」の実施記録である。

1. 開催の目的と背景

本発表会の主な目的は以下の 3 点である。

- ・九州大学(KU)とマレーシア工科大学(UTM)の大学院生による研究交流：
両大学の学生計 10 名が登壇し、英語での研究発表および質疑応答を通じて学術的知見を深める。
- ・学生主体の運営とネットワーク構築：
九州大学マス・フォア・インダストリ研究所(IMI)の支援のもと、学生オーガナイザー (門脇, 菅, 林) が企画から当日の進行までを主導した。学生自身が国際交流の場を創出することで、運営能力の向上とフラットな関係構築を目指す。
- ・持続的な関係性の強化：
本夏の UTM 訪問時の交流を起点としている。帰国後に日本側から発信する形で発表会を企画し、両大学の学生の継続的な関係発展を図る。

2. 期待される成果

本発表会の実施により、以下の成果が期待される。

- ・多角的な視点の獲得と研究の発展：
10 名の登壇者による多様なテーマ (流体モデル, 統計, 深層学習など) の発表と議論を通じて、参加者それぞれが自身の研究に対する新たな知見やアプローチを獲得すること。
- ・国際的コミュニケーション能力と運営スキルの向上：
英語での発表および質疑応答の経験により、参加学生の国際的な発信力が強化されること。また、学生オーガナイザー (門脇, 菅, 林) が司会進行やタイムキーパーなどの運営を主導することで、実践的な国際イベントのマネジメントスキルを習得すること。
- ・持続的なネットワークと共同研究の基盤構築：
発表での質疑応答や発表後の交流会 (Networking Session) における直接的な対話を通じて、KU と UTM の学生や研究者間に強固な人脈が形成されること。これが将来的な共同研究の創出や、今後の継続的な交流プログラムの開催へと繋がること。

3. 活動実績

3.0. 制作物

- ・ポスターおよびデジタルサイネージ掲載用画像：会場前へのポスター掲示および学内のデジタルサイネージでの表示
- ・パンフレット：告知メールへの添付および参加者へのデータ配布

3.1. 交流活動

- ・ネットワークスペースの活用：発表会の休憩中や終了後に講演者同士や参加者との交流を図った。

3.2. 当日の進行と参加者

当日は発表者を含め計 24 名が参加した。

13:00 - 13:45：開会挨拶，Session 1（発表 3 名）

13:45 - 14:00：休憩

14:00 - 14:45：Session 2（発表 3 名）

14:45 - 15:00：休憩

15:00 - 16:00：Session 3（発表 4 名），閉会挨拶

16:00 - 16:30：Networking Session（交流会），表彰式

3.3. 発表者および発表内容

各 Session において，計 10 名（KU・UTM 学生）が以下のテーマ・順番で発表を行った。

Session 1

- ・Taiga Kadowaki (KU)：

"Stochastic Growth Modeling of Vascular Plaque Dynamics and Optimization of Catheter-Based Drug Delivery"

- ・Fatanah Binti Hamzah (UTM)：

"Two-Dimensional Dam-Break Debris Flow Model Incorporating Voellmy Rheology, Earth pressure coefficient and Coriolis Parameter"

- ・Katsunari Fujishima (KU)：

"Mathematical Optimization of Study Time Allocation for Japanese University Entrance Examinations"

Session 2

- Yoshimichi Hayashi (KU) :
"Application of Bioconvection Model Framework to Vegetation Distribution"
- Ang Chin Xiang (UTM) :
"Omega Limiting Set of b-Bistochastic Quadratic Stochastic Operator"
- Go Hashimoto (KU) :
"Description of hybrid systems by term rewriting"

Session3

- Junya Miyake (KU) :
"Bayesian Estimation for Variable Selection and Fusion Based on a Nonlocal Prior"
- Nwebonyi James Ugochukwu (KU) :
"Optimal Intermittent Hierarchical Control for Multi-Agent Systems (MASS)"
- Aina Nuha binti Che Mahadzir (UTM) :
"Explainable Deep Learning Model using Large Language Model for Palm Oil Fresh Fruit Ripeness"
- Haruka Suga (KU) :
"A Mathematical Model for the Optimal Treatment Order of Multiple Vascular Stenoses"

3.4. 表彰

本発表会では、優れた発表を称えるため、現地参加の KU および UTM の教員による審査に基づき、以下の 2 つの賞が授与された。

- Best Research Presentation Award : Junya Miyake (KU)
- Best Presentation Award : Ang Chin Xiang (UTM)

4. 今後の展望

本発表会の成果と反省を踏まえ、以下の展望が挙げられる。

- 定期的な交流プログラムの定着 :
本年夏の KU 学生による UTM 訪問、および今回の KU での発表会開催という相互交流の実績

を基盤とし、今後も定期的な研究交流イベントとして定着させる。

- ・共同研究への具体的展開：

各発表や Networking Session で形成された学生間のネットワークを活用し、単発の交流に留まらず、実際の共同研究プロジェクトの立ち上げへと発展させる。

- ・学生主体の運営体制の継続・継承：

「Student-Led」の枠組みを維持し、次世代の大学院生へオーガナイザーの役割を引き継ぐことで、学生の国際的リーダーシップおよびイベント運営ノウハウを継続的に育成・蓄積する。

5. 総括

本イベント「UTM-KU Student-Led Graduate Student Research Exchange Program」は、九州大学 IMI の支援のもと成功裏に終了した。本発表会を通じて得られた主な実績は以下の通りである。

- ・円滑な実施と発表の完遂：

伊都キャンパス、および Zoom を用いたハイブリッド形式にて、KU と UTM の学生計 10 名が英語での研究発表を完遂した。計 24 名の参加者を得て、多様な専門分野にわたる活発な議論が行われた。

- ・交流会を通じた関係性の構築：

プログラムの最後に交流会（Networking Session）を実施し、両大学の学生・教員間で直接的な対話を行うことで、学術・文化両面での親睦を深めた。

本発表会は、同年夏の UTM 訪問を契機とした両校の交流を単発で終わらせず、日本側から発信する形で継続させた点に大きな意義がある。今回確立された「Student-Led」の枠組みと参加者間のネットワークは、今後の持続的な研究交流に向けた重要な基盤となった。

以上

UTM-KU STUDENT-LED GRADUATE STUDENT RESEARCH EXCHANGE PROGRAM

VENUE: IMI AUDITORIUM (W1-D413), ITO CAMPUS, KYUSHU UNIV.
DATE: MONDAY, SEPTEMBER 28, 2026, 13:00 - 16:30 (OPEN 12:30)

PROGRAM

- Taiga Kadowaki : Stochastic Growth Modeling of Vascular Plaque Dynamics and Optimization of Catheter-Based Drug Delivery
- Fatanah Binti Hamzah : Two-Dimensional Dam-Break Debris Flow Model Incorporating Voellmy Rheology, Earth pressure coefficient and Coriolis Parameter
- Katsunari Fujishima : Mathematical Optimization of Study Time Allocation for Japanese University Entrance Examinations
- Yoshimichi Hayashi : Application of Bioconvection Model Framework to Vegetation Distribution
- Ang Chin Xiang: Omega Limiting Set of b-Bistochastic Quadratic Stochastic Operator
- Go Hashimoto : Description of hybrid systems by term rewriting
- Junya Miyake : Bayesian Estimation for Variable Selection and Fusion Based on a Nonlocal Prior
- Nwebonyi James Ugochukwu : Optimal Intermittent Hierarchical Control for Multi-Agent Systems (MASs)
- Aina Nuha binti Che Mahadzir : Explainable Deep Learning Model using Large Language Model for Palm Oil Fresh Fruit Ripeness
- Haruka Suga : A Mathematical Model for the Optimal Treatment Order of Multiple Vascular Stenoses

STUDENT ORGANIZER: TAIGA KADOWAKI, HARUKA SUGA, YOSHIMICHI HAYASHI
SUPPORTED BY IMI, KYUSHU UNIVERSITY, UTM- CIAM, JST NEXUS

REGISTRATION



MORE INFORMATION
EMAIL: kadowaki.taiga.841@s.kyushu-u.ac.jp

JOIN ONLINE

Open to all

After registering,
you will receive the
Zoom meeting link.

【参考】パンフレット

September 28, 2026

UTM-KU
Student-Led
Graduate Student
Research
Exchange
Program

Kyushu University Student Organizers:
・ Taiga Kadowaki
・ Haruka Suga
・ Yoshimichi Hayashi

Date: Monday, September 28, 2026

Time: 13:00~16:30 (JST)

Venue: IMI Auditorium (W1-D413), Ito Campus, Kyushu University

Supported by IMI Kyushu University, UTM- CIAM, JST NEXUS

Program

13:00-13:15 / Taiga Kadowaki

13:15-13:30 / Fatanah Binti Hamzah

13:30-13:45 / Katsunari Fujishima

13:45-14:00 / Break

14:00-14:15 / Yoshimichi Hayashi

14:15-14:30 / Ang Chin Xiang

14:30-14:45 / Go Hashimoto

14:45-15:00 / Break

15:00-15:15 / Junya Miyake

15:15-15:30 / Nwebonyi James Ugochukwu

15:30-15:45 / Aina Nuha binti Che Mahadzir

15:45-16:00 / Haruka Suga

16:00-16:30 / Networking Session

STUDENT PRESENTATION PROFILES

Name

Taiga Kadowaki

Affiliation: Kyushu University
Current Year of Study: Master's Student (M2)
Supervisor: Atsushi Tera



Presentation Title

Stochastic Growth Modeling of Vascular Plaque Dynamics and Optimization of Catheter-Based Drug Delivery

Abstract (max. 50 words)

This study proposes a stochastic growth model to simulate vascular plaque dynamics and optimize targeted drug delivery. By formulating particle advection-diffusion as an absorbing Markov process, we efficiently compute reaching probabilities and derive optimal dosing curves for catheter positioning, drastically reducing the computational costs of traditional fluid dynamics.

Three Key Research Points

1. Vascular plaque
2. Stochastic growth
3. Markov process

Name

Fatanah Binti Hamzah

Affiliation: Universiti Teknologi Malaysia (UTM)
Current Year of Study: Master's student (M2)
Supervisor: Zubaila Binti Ismail



Presentation Title

Two-Dimensional Dam-Break Debris Flow Model Incorporating Voellmy Rheology, Earth pressure coefficient and Coriolis Parameter

Abstract (max. 50 words)

Debris flow is a known natural disaster that takes place in Malaysia over the years. Representing its behaviour through mathematical modelling remains a challenge until this date. This study introduces a two-dimensional depth-averaged debris flow model incorporating Voellmy rheology, earth pressure coefficient and Coriolis effect for hazard assessment simulation.

Three Key Research Points

1. Mathematical Modelling
2. Physical Mechanisms
3. Numerical Method

STUDENT PRESENTATION PROFILES

Name

Katsunari Fujishima

Affiliation: Kyushu University
Current Year of Study: Master's Student (M2)
Supervisor: Atsushi Tera



Presentation Title

Mathematical Optimization of Study Time Allocation for Japanese University Entrance Examinations

Abstract (max. 50 words)

This study develops a mathematical optimization model for study time allocation in Japanese university entrance examinations. Learning and forgetting curves are incorporated to represent academic performance. Numerical optimization identifies effective subject-specific study schedules under time constraints, providing a quantitative framework for improving learning efficiency and examination performance.

Three Key Research Points

1. Mathematical Modeling of Academic Performance
2. Optimization of Study Time Allocation
3. Quantitative Evaluation of Learning Strategies

Name

Yoshimichi Hayashi

Affiliation: Kyushu University
Current Year of Study: Master's Student (M2)
Supervisor: Atsushi Tera



Presentation Title

Application of Bioconvection Model Framework to Vegetation Distribution

Abstract (max. 50 words)

We propose a novel mathematical framework applying bioconvection and partial differential equation (PDE) models to vegetation distribution patterns. Extending previous research on biological cell movement and pattern formation, this joint study with UTM aims to analyze ecological spatial structures, establishing a theoretical foundation for modeling diverse vegetation dynamics.

Three Key Research Points

1. Bioconvection
2. PDE
3. Bifurcation

STUDENT PRESENTATION PROFILES Name Ang Chin Xiang Affiliation: Universiti Teknologi Malaysia (UTM) Current Year of Study: Doctoral Student (D2) Supervisor: Ahmad Fadillah bin Embong  Presentation Title Omega Limiting Set of b-Bistochastic Quadratic Stochastic Operator Abstract (max. 50 words) Quadratic Stochastic Operators (QSOs) is widely used in predicting population genetics. A class of QSO known as b-bistochastic QSO is formed by taking the b-majorization of the operator. This article describes the omega limiting set of the b-bistochastic QSO on any finite dimensional simplex as it is one of the main problems in non linear operator theory. Three Key Research Points 1. quadratic stochastic operator 2. nonlinear operator 3. doubly stochastic Name Go Hashimoto Affiliation: Kyushu University Current Year of Study: Doctoral Student (D3) Supervisor: Daniel Guina  Presentation Title Description of hybrid systems by term rewriting Abstract (max. 50 words) A hybrid system combines continuous changes, such as those in differential equations, with discrete control. Rewriting systems are used to determine whether a target state can be reached using given rewriting rules. Here, we consider the collision problem in hybrid systems using a "second-order" term rewriting system. Three Key Research Points 1. Term rewriting systems are well-suited for discussing reachability to a system's target state. 2. By introducing operations on binary relations, the behavior of rewriting systems can be described logically. 3. Hybrid system problems can also be handled by using a rewriting system that includes function terms.	STUDENT PRESENTATION PROFILES Name Junya Miyake Affiliation: Kyushu University Current Year of Study: Master's Student (M2) Supervisor: Shuichi Kawano  Presentation Title Bayesian Estimation for Variable Selection and Fusion Based on a Nonlocal Prior Abstract (max. 50 words) We propose a Bayesian method for simultaneous variable fusion and selection in linear regression. We construct a nonlocal spike-and-slab prior specifically designed for variable fusion to improve model selection within Bayesian model averaging. Theoretical and empirical studies demonstrate the effectiveness of the proposed method. Three Key Research Points 1. Bayesian Analysis 2. Variable fusion 3. Non-local prior Name Nwibonyi Ugochukwu James Affiliation: Kyushu University Current Year of Study: Doctoral Student (D1) Supervisor: Matsue Kaname  Presentation Title Optimal Intermittent Hierarchical Control for Multi-Agent Systems (MA5s) Abstract (max. 50 words) This study develops an intermittent global linear-quadratic regulator (LQR) for heterogeneous linear time-varying (LTV) multi-agent systems. Network-structured weights and a scheduled aggregate differential Riccati equation determine the controller, while an ON-OFF signal enforces zero input during inactive intervals. Lyapunov analysis establishes sufficient conditions for exponential stability of the system and consensus. Three Key Research Points 1. Aggregate LQR controller design 2. Intermittent network-structured control 3. Stability and consensus analysis
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STUDENT PRESENTATION PROFILES Name Aina Nuha binti Che Mahadzir Affiliation: Universiti Teknologi Malaysia (UTM) Current Year of Study: Master's Student (M2) Supervisor: Nurulqifa binti Khamsi  Presentation Title Explainable Deep Learning Model using Large Language Model for Palm Oil Fresh Fruit Ripeness Abstract (max. 50 words) XAI Palm Oil Inspector presents an explainable AI framework for FFB ripeness classification and harvest recommendation per MPOB standards. A YOLOv8m detector with colour-focused augmentation improves detection accuracy over the original dataset. Combined with Qwin2.5-VL and Deepseek R1 reasoning, the pipeline embeds MPOB domain rules to deliver transparent, field-applicable harvest decisions. Three Key Research Points 1. Explainable AI 2. Object detection 3. FFB Ripeness Grading Name Haruka Suga Affiliation: Kyushu University Current Year of Study: Master's Student (M2) Supervisor: Atsushi Tero  Presentation Title A Mathematical Model for the Optimal Treatment Order of Multiple Vascular Stenoses Abstract (max. 50 words) To optimize catheter treatment for multiple vascular stenoses, we incorporated flow rates derived from Navier-Stokes equations into differential models via simplified fitting, reducing computational costs in complex networks. Results showed that leaving a larger stenosis reduces blood flow, thereby shortening total treatment time and determining the optimal catheter intervention sequence. Three Key Research Points 1. Mathematical modeling 2. Optimal treatment sequence 3. Computational cost reduction	STUDENT PRESENTATION PROFILES Name Haruka Suga Affiliation: Kyushu University Current Year of Study: Master's Student (M2) Supervisor: Atsushi Tero  Presentation Title A Mathematical Model for the Optimal Treatment Order of Multiple Vascular Stenoses Abstract (max. 50 words) To optimize catheter treatment for multiple vascular stenoses, we incorporated flow rates derived from Navier-Stokes equations into differential models via simplified fitting, reducing computational costs in complex networks. Results showed that leaving a larger stenosis reduces blood flow, thereby shortening total treatment time and determining the optimal catheter intervention sequence. Three Key Research Points 1. Mathematical modeling 2. Optimal treatment sequence 3. Computational cost reduction
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