

FY2026 Researcher Exchange Program for Future Global Leaders

Kick-off Meeting

Tuesday, June 9, 2026, 15:15-16:45

SAKIGAKE Club Space

-Hybrid format- (Co-Creation Innovation Bldg. 6F)

15:15 (10min) Opening remarks by EVP Onoye

15:25 (15min) Dispatch Report and Q&A session

15:40 (45min) Research Presentation and Q&A session

16:25 (20min) Free discussion time

16:45 Closing remarks by EVP Miyamoto

Researcher Exchange Program for Future Global Leaders

The University of Osaka Foundation for the Future (Research and other support business fund) supports early-career researchers, such as postdocs and doctoral students, to gain international research experience, fostering future leaders in academic research.

ATTENDEES

- Trustees -

- ONOYE Takao / Executive Vice President for Research <online>
- MIYAMOTO Yoichi / Executive Vice President for Global Education
- HAYASHI Mikako / Executive Vice President for Global Engagement

- Overseas Centers, Institute for International Initiatives -

- ITO Chihiro / Vice Director
- MATSUNO Kenji / Director, European Center for Academic Initiatives
- YAMAMOTO Beverley Anne / Director, North American Center for Academic Initiatives

- Office of Management and Planning -

- TAKANO Makoto / Senior Research Manager
- OKAMOTO Noriko / Research Manager

- Department of Co-Creation Promotion- <online>

- Department of Research Promotion -

No.	Researcher	Affiliation ※Department/affiliation and year level are as of the time of selection	Destination
FY2025 recipients (Dispatch Report)			
1	YAMAMURA Shisato	Engineering (D2)	University of Oxford
2	NAITO Masahiro	Humanities (D1)	King's College London
FY2026 recipients (Research Presentation)			
3	TAKEUCHI Masaki <online>	Engineering Science (D2)	University of Oxford
4	MIYAWAKI Ayari	Engineering Science (D2)	Saarland University
5	SAKATA Wataru	Engineering (D1)	Johns Hopkins University
6	NITATOGE Kaito	Pharmaceutical Sciences(D3)	Julius-Maximilians-Universität Würzburg
7	KASAI Gen	Humanities (D2)	The University of Connecticut
8	YONEKURA Haruki <absence>	Information Science and Technology(D3)	Otto-Friedrich-University Bamberg
FY2026 recipient of the Kyowa Technologies Researcher Exchange Program for Future ICT Leaders (Research Presentation)			
9	KIYOMOTO Kotoe	Pharmaceutical Sciences(D2)	Georg-August-Universität Göttingen

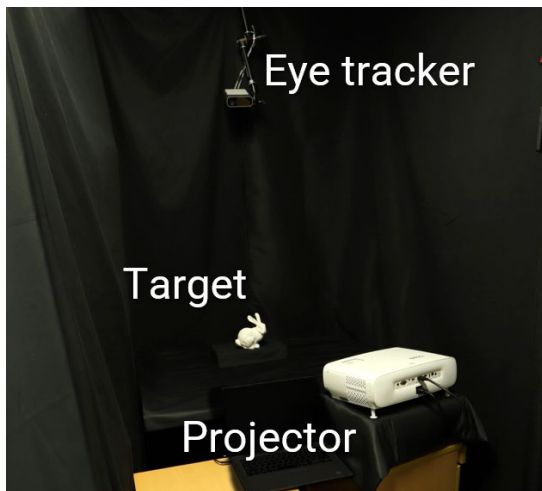
Projection mapping: a new tool for studying human perception

Stimulus presentation devices in vision science

Conventional: 2D display, HMD

Identified Cues that contribute to the perception of gloss ► Motion, Specular highlight, Color...

This work: Projector & 3D physical object



Setup example



Projecting glossy textures
(Highlight shifts with viewpoint)

2026/06/09



Rapidly thermo-responsive structural color hydrogel with core/shell nanoparticles

2026/09/26 ~ 2026/10/30, Germany

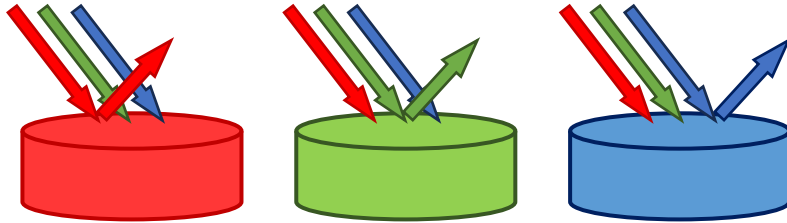
Saarland University



Div. Chemical Engineering
D2 Ayari Miyawaki

Structural color

Mechanism of coloring



Absorbs and reflects light
at selective wavelengths

Pigment color

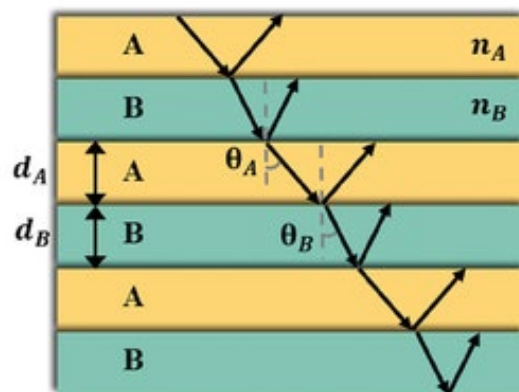
- Coloration by molecules

Structural color (Soap bubble, feather)

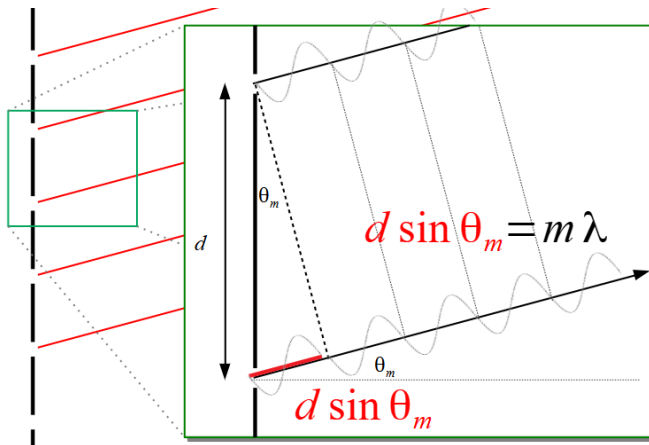
- Coloration by nanostructure
- Bright and stable



Mechanism of structural coloration



Multilayer



λ = structural color

Thermochromism

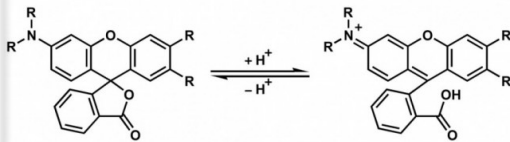
Thermochromic materials

- Indicator for optimal temperature
- Preventing burns and accidents



<https://www.colorsuv.com/thermochromic-inks/>

Leuco dyes



<https://ymdchem.com/en/pages/133/>

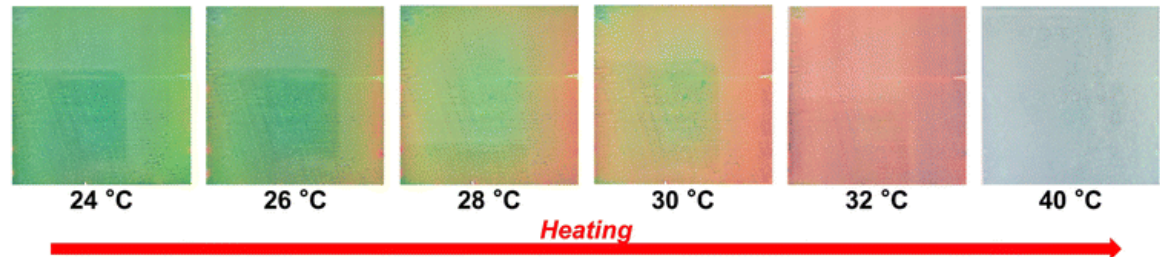
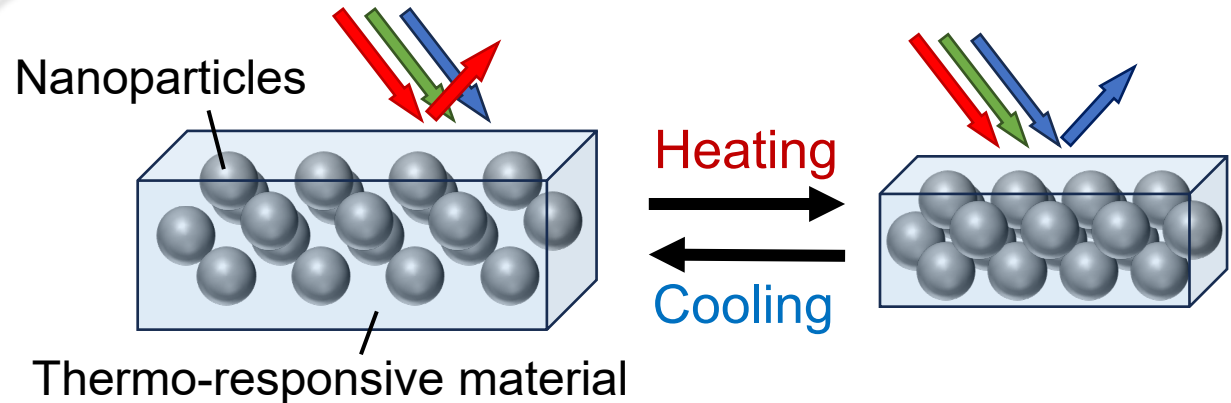


<https://spotsee.io/technologies/thermochromics-leuco-dye>



Photofading

Structural color



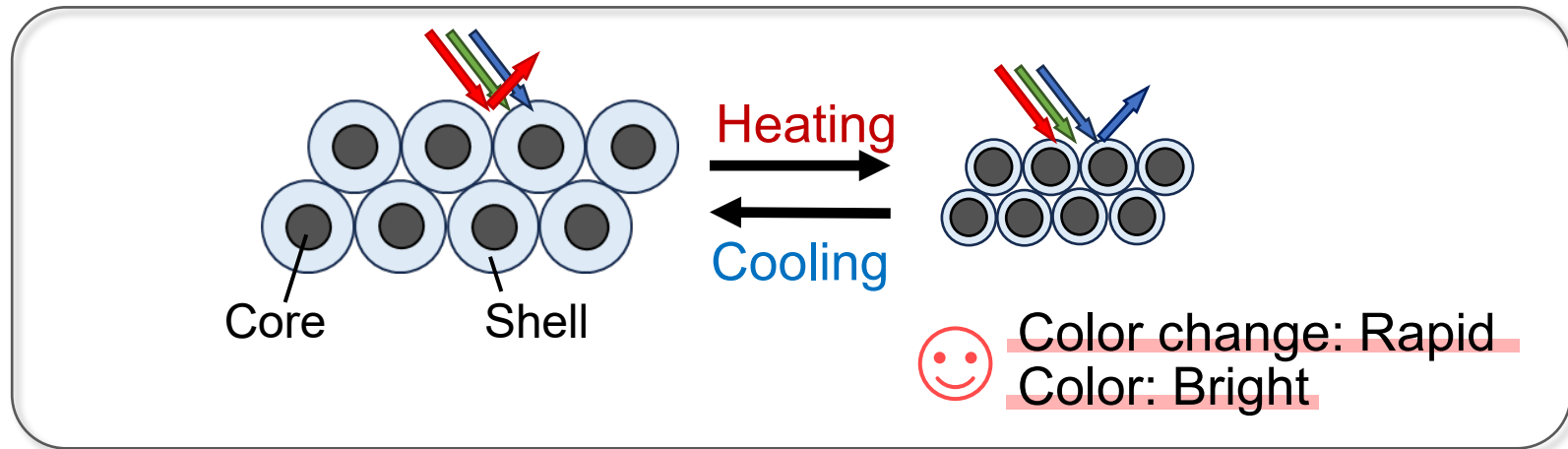
Li et al., *J. Mater. Chem. A*, **13**, 18833-18841 (2025)



Color change: Slow

In this study

Preparation of structural color hydrogels with crosslinked core/shell particles



Saarland University

Location: Saarbrücken, Germany

Established: 1948

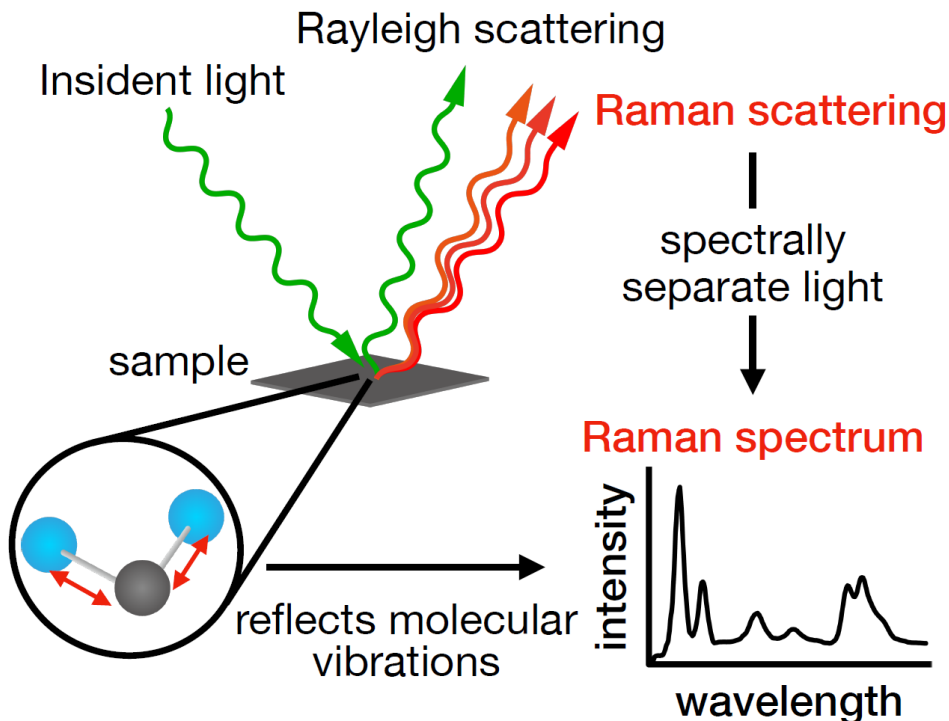
Students: 16,300



Development of a SERS-Based Exosome Analysis Platform Towards Cancer Diagnosis through Liquid Biopsy

D1, Wataru Sakata

Background: Raman spectroscopy



Raman spectroscopy enables label-free molecular analysis.

Challenge in the analysis of low-concentration molecules

e.g.

- Exosome-associated molecules (protein, lipid, and nucleic acids)
- Drug
- Metabolites

Intrinsic weak signal of Raman spectroscopy

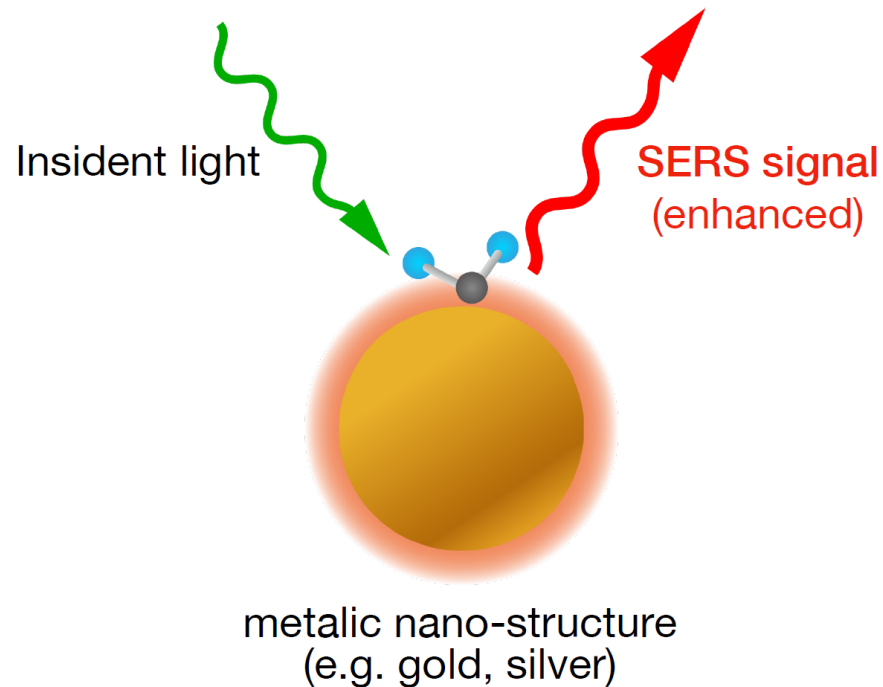
- Low sensitivity
- Long acquisition time



Signal enhancement is essential for detection of the low-concentration molecules

Surface-Enhanced Raman Scattering(SERS)

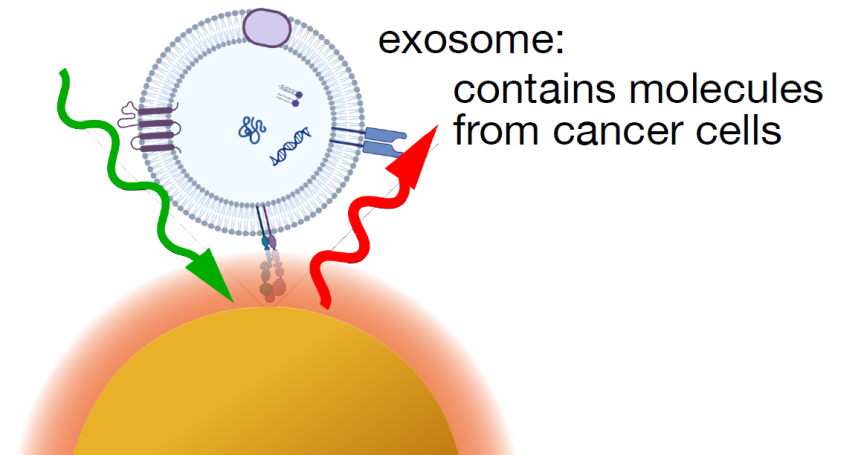
Phenomenon that enhances the Raman signals of molecules close to metallic nano-structure surfaces



SERS enables highly sensitive molecular detection.

Research at Johns Hopkins University

Apply the metal nano-structure to biomarker detection.



Aim for early cancer diagnosis
through liquid biopsy.

What I want to learn in Johns Hopkins:

- high-sensitivity SERS measurement
- data analysis method

Current and future research of functional nucleic acids

Kaito Nitatouge, D3, Obika Lab, Grad. Sch. Pharm. Sci., Osaka Univ.

Current work in Japan

Aptamers

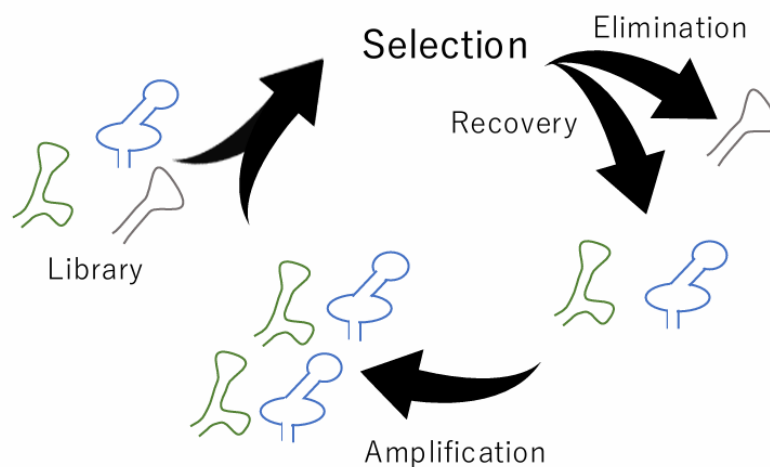
recognize target molecules



Potential application
• Delivery vehicles

Core technology

Directed evolution



Future work in Germany

Ribozymes

catalyze chemical reactions

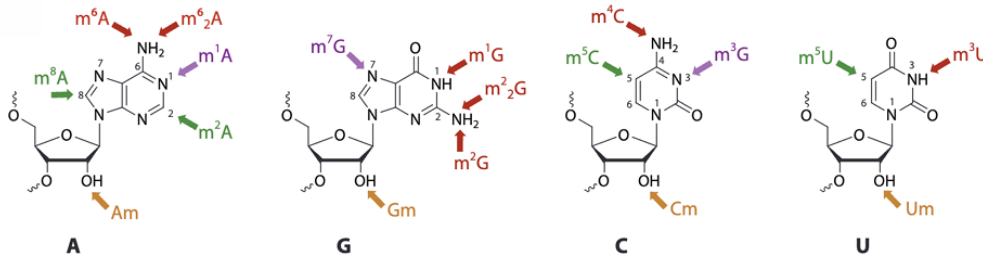


Potential application
• Therapeutic agents

Expanding directed evolution from molecular recognition to catalysis

Exploration of 2'-*O*-methyltransferase ribozymes

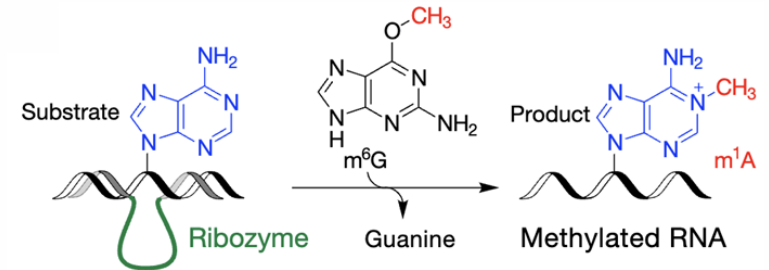
RNA methylation



Regulator of cellular function

Höbartner C. *et al.*, *Annual Review of Biochemistry*. 2024

Methyltransferase ribozyme



First report of methyltransferase ribozyme

Höbartner C. *et al.*, *Nature*. 2020

2'-*O*-methyltransferase ribozymes



Challenge

- Difficulty in distinguishing from other methylation sites
→ 2'-*O*-methyltransferase ribozymes remain undiscovered.

Impact

- New therapeutic avenues for RNA modification–driven diseases

Unlocking the therapeutic potential of functional nucleic acids

Gen KASAI

- Major: Linguistics, Generative Grammar, Syntax, Morphology
- Generative Grammar
- ☞ To seek an explanation what linguistic abilities of humans are.
- Big Interest: How is Syntax (creation of phrases and sentences) related to Morphology (word formation).
- Specific Interest: Ellipsis, Movement, etc

My Research Program

- ① Title: Morphological Repair Strategies via Argument Ellipsis: A Cross-Linguistic Perspective (in The University of Connecticut)
- ② Main Focus: Argument (subjects and objects) Ellipsis (AE) saves mismatched Modal Particles (e.g., *-tai* 'Optative', *-yoo* 'Intensive') in Japanese (Takita 2025).
 - ☞ Extension to Languages that have AE (e.g., Chinese, Korean, Serbo-Croatian, etc)
- ③ Contribution: The repair strategy of ellipsis suggests that word formation should be done in PF (Halle and Marantz 1993).

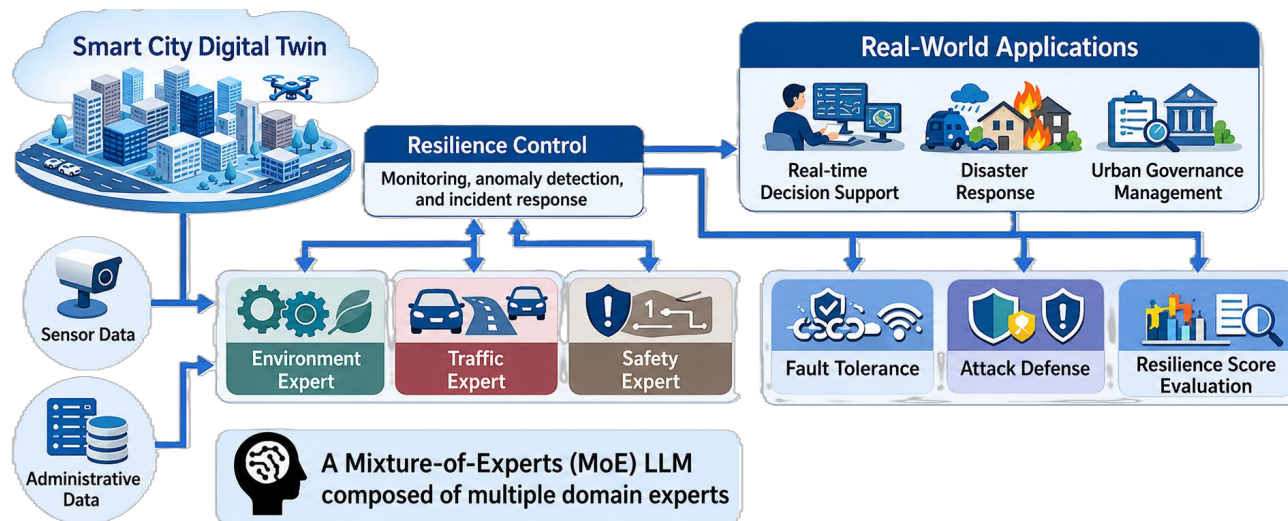
Trustworthy Distributed LLM Infrastructure for Smart-city Digital Twins

Haruki YONEKURA

Contact: <https://yone550.github.io/en/>



How can distributed LLM services operate safely and reliably for a smart city?



- Urban digital twins connect sensor streams, mobility data, incident logs, and simulations to support real-time city operations.
- LLM infrastructure must be reliable, auditable, and controllable despite failures, privacy constraints, and compromised experts.

次世代グローバルリーダー海外派遣プログラム キックオフミーティング

Host Institution: University of Bamberg, Chair of Mobile Systems

Bamberg provides an ideal environment for smart-city research and field visits, as the city has actively introduced sensor-based infrastructure and urban digital technologies.

The University of Bamberg



members)

University History

1647 Prince-Bishop Melchior OTTO Voit von Salzburg founds the Academia Ottoniana

1773 Prince-Bishop FRIEDRICH Karl von Schönborn expands the Academia Ottoniana into the Universitas Ottoniana Friderician

1803 The four-faculty university is dissolved, and the theology and philosophy faculties are continued as a Lyceum

1923 Official founding of a philosophical-theological institution of higher education

1979 The entire institution is again granted the status of "university"

1988 Since October 1, the university has been known by its current name, the "Otto-Friedrich-Universität Bamberg"

Four Faculties

Humanities



Social Sciences, Economics and Business Administration



Human Sciences and Education



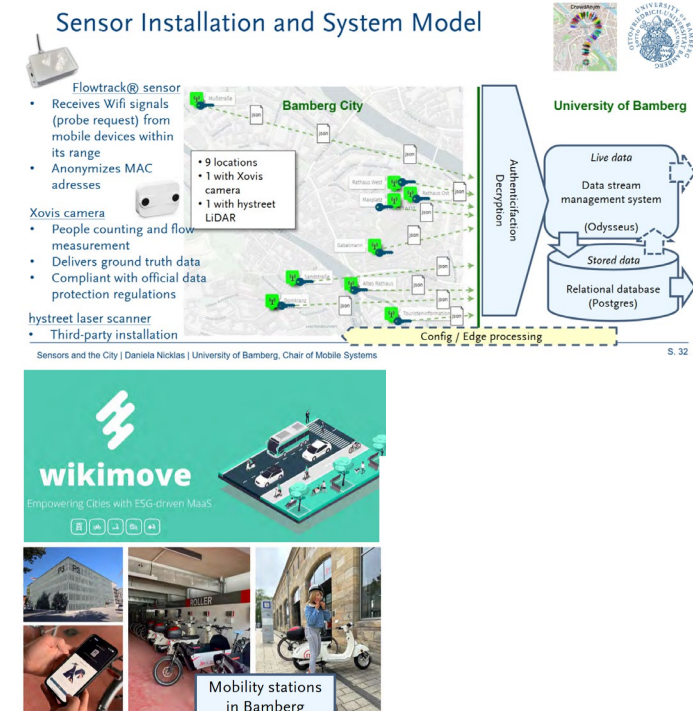
Information Systems and Applied Computer Science



International Perspectives

- ✓ The University successfully participated in the Audit *Internationalisation of Universities* carried out by the German Rectors' Conference (HRK).
- ✓ Each year, over 500 University of Bamberg students take advantage of opportunities to pursue foreign studies at one of 300 partner institutions in 60 countries.
- ✓ Looking only at the EU's popular *Erasmus Programme*, an average of 25% of the students in each year's class participate in an exchange.
- ✓ Foreign students in Bamberg: ~ 1000 per annum
- ✓ Bamberg participants in foreign exchange programmes: (approx.) ~ 500 per annum





Cisplatin (CDDP)-induced nephrotoxicity (CIN)



✓ Leads to Treatment Delays and Discontinuation

✓ Increases Healthcare System Burden



✓ $\approx$ One-third of Patients Receiving CDDP Develop CIN

Limitations of Existing Prediction Models

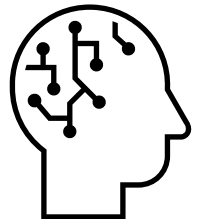
✓ Insufficient Number of Patients

✓ Not Evaluated on Independent Test Datasets (Huang et al, 2022)

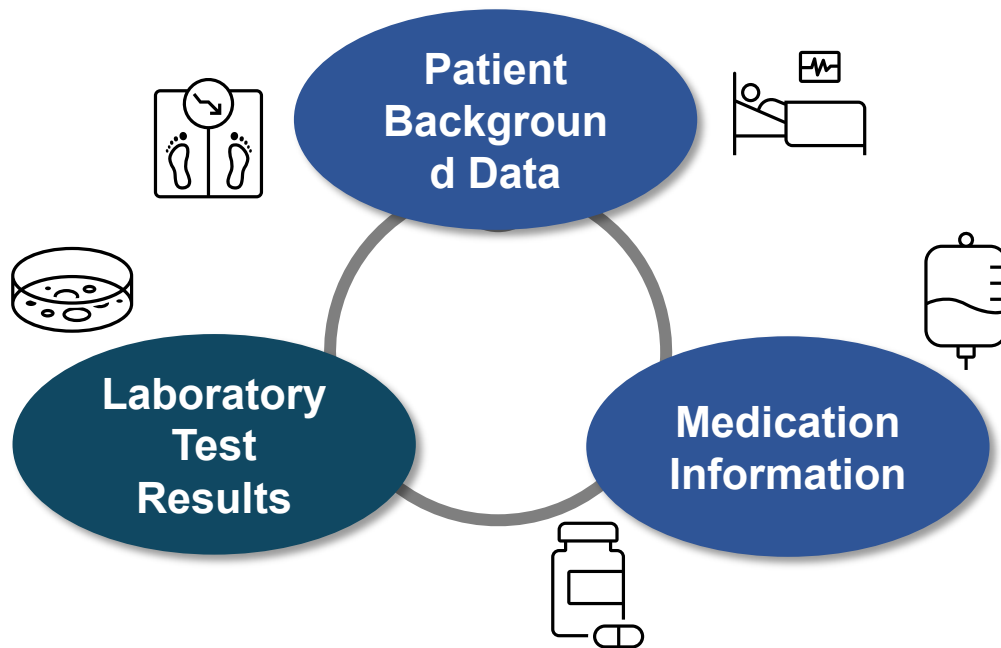
✓ Using Under-sampling Techniques to Address Class Imbalance (Ambe et al, 2025)

✓ Suboptimal Predictive Performance

(Ambe et al, 2025, Okawa et al, 2022)



Prediction Models for CIN Using EHR Data



- ✓ First-time CDDP-treated patients(April 2010-April 2025, n = 3665 prior to exclusion criteria)
- ✓ Application of machine learning techniques
- ✓ Oversampling techniques for class imbalance handling
- ✓ Demographics and longitudinal laboratory data



To develop a CIN prediction model and implement it as software to improve individualized prevention and CDDP treatment outcomes.