

Warning

Make sure you are viewing the correct slide deck (**blue highlights**) that is applicable to the semester for which you are considering starting UROP, as requirements may change.

This deck is for **AY 24/25 Sem 2**, presented on **2 October 2024**, for prospective UROP students formally starting in **January 2025**.



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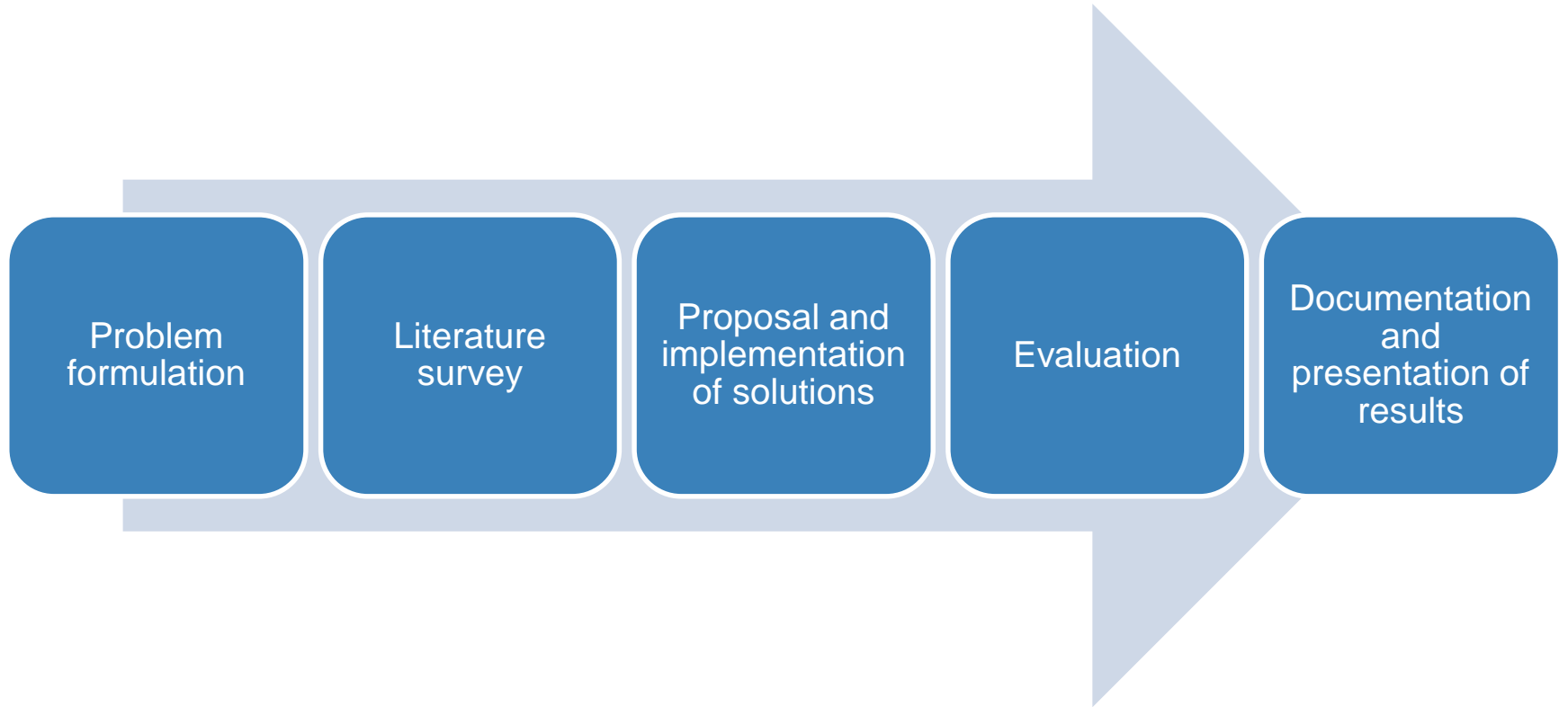


NUS SoC UROP Briefing

For **AY 2024/2025 Sem 2**

Presented by Dr Zhao Jin
Assisted by Ms Sharifah
(Revised **18 Sept 2024**)

A typical **Research** Project



Objectives of UROP

Allows undergraduates to

- **participate** in a **year-long, active research** project
- **experience** first hand the challenges and exhilaration of research, discovery and invention
- **learn** from a faculty member, who is an expert researcher doing cutting-edge research.
- **pick up** new technologies, knowledge and skills



Feedback from UROP students

...UROP provides a unique opportunity for students to **explore their research interests and get a first-hand taste** of what research feels like during their undergraduate years.

This experience has allowed me to understand the importance of **asking good questions, communicating ideas, and deciding which problems are worth pursuing** and which wants are not.

These skills will come in handy in or outside of an academic setting, and I **strongly recommend** first year students to plan for potentially including a UROP in their academic plan.

Computations with Addition Machines

Tan Matthew Simon Castaneda

Supervised by: Frank Stephan

Feedback from UROP students

The UROP program has been an enriching and enlightening experience, providing a valuable insight into **what research involves** and offering deep insights into **research methodology and the application of advanced techniques**. It allowed me to engage intensively with my areas of interest, bridging theoretical knowledge with practical application.

The **invaluable mentorship** from my **supervisor**, coupled with the supportive and educational environment fostered by a **PhD student** in the research group, significantly enriched my learning experience.

The UROP program is a **highly recommended** initiative for those aspiring to delve deeper into academia or research, equipping participants with essential skills for rigorous research and innovation.

Domain Generalized Semantic Segmentation in 3d Urban Scene

Student: Huang Yuqi

Supervised by Lee Gim Hee

Feedback from UROP students

The UROP programme is an amazing **opportunity for** anyone interested in **pursuing further studies or a career in academia**.

The programme gave me the chance to choose a topic that I was genuinely interested in and to study it in-depth. It also helped me to better understand **the non-technical skills needed to make a good researcher** such as what makes a good research paper and how to present the results of your research.

During the entire course of the programme, I was given a great deal of **guidance** and **support** from not only my supervisor but also from the postdocs and phd students in the research group.

You Only Spike Once: Improving Energy-Efficient Neuromorphic Inference to ANN-Level Accuracy

Kyle Timothy Ng Chu
Supervised by Trevor Erik

Feedback from UROP students

This UROP programme provided me an exceptional opportunity to **explore advanced topics** in harmonic analysis, Strichartz estimates, and their role connecting with differential geometry and general relativity.

Under the guidance of my supervisor, I gained a deep understanding of the in-depth theory of partial differential equations (PDEs) and advanced analysis, particularly in relation to wave equations in curved spacetime settings.

Automated Machine Learning in Language Models

Yu Zongmin

Supervised by: Low Kian Hsiang

Feedback from UROP students

UROP gives me the opportunity to **learn many things that are yet not covered in the lectures**, such as multimodal llms. These are the HOTS topics nowadays out there but it is barely touched by the curriculum, so I have the time to self-learn and dig further my interest in the field.

UROP is also a good opportunity for me to know what I would like to do in my **FYP**, as I have the prerequisite knowledge now of how the field of llm works.

Sports Analytics using Probabilistic Model Checking, Computer Vision and Machine Learning

Yeoh Zhong Han Ervin

Supervised by Akshay Narayan

Feedback from Faculties



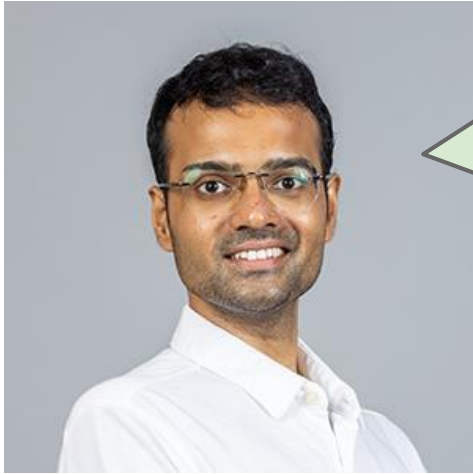
Prof. Trevor Erik Carlson

We have been **extremely happy** with the work that we have done with our UROP students.

Together, I work to treat our researchers as close member of our team, and through collaboration and drive by the students, we **have published papers** and our work has formed the basis of new research projects. Together, we have **built new AI accelerator hardware and designed new AI algorithms** to improve the speed and efficiency of AI systems.

Overall, I've been **very impressed by the work** the students can accomplish, and they have, and will continue to make an impact as a part of our research group.

Feedback from Faculties

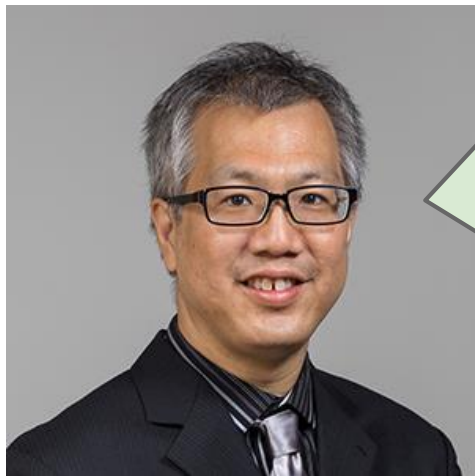


Prof. Umang Mathur

My experience has been very **positive and fulfilling**; UROP is a great opportunity for both students and their supervisors.

Personally, it has been amazing to work with enthusiastic undergraduate students. I have been fortunate to work with **students who are enthusiastic and excited** to learn and discover new things, **think carefully** about how to formulate and solve problems, and **work hard towards** findings the best way to present their findings.

Feedback from Faculties



Prof. Kan Min-Yen

UROP gives you an opportunity to **study specific topics** in computer, science and information systems research rigorously. In my area (natural language processing), this takes the concrete form of annotating data, formulating scientific hypotheses and testing computational models that you devise to test the hypothesis.

To succeed in UROP, students need to **be fully committed to conduct high-quality research and invest sufficient time**. Only with such internal motivation can they overcome the learning curve, which requires much independence: task decomposition, grasp new knowledge in a new field, formulate scientific hypotheses, and prove them using state-of-the-art methods.

We recommend that UROP in a specific area (e.g., AI and NLP) **have taken or are going to concurrently take the corresponding general courses** in NUS: CS2109S Intro to AI/ML, CS3244 Machine Learning and CS4248 (preferably excelling in the project components), so that they can be familiar with the background.

Feedback from Faculties



Prof. Martin Henz

The UROP projects give me an opportunity to closely work with the students and guide them in their effort to **make a significant improvement on the systems that I'm developing**. The nature of UROP allows **exploration of new directions that might otherwise remain unexplored**. Students enjoy these explorations and the freedom to be independent of operational requirements from existing users.

In our work on Source Academy, our projects are developing entirely new prototypical language implementations that can then be further developed in **FYP**.

I'd like to highlight the option to **"upgrade" UROP using the REX scheme**, which my current two UROP students are taking advantage of, which allows them to visit conferences and research and development labs overseas that are related to their work.

Important Considerations

- The UROP is challenging with a substantial workload.
- UROP must be done in **2 consecutive semesters**.
- UROP students are **not** allowed to go for internships / exchange during UROP.
- Alternatives to UROP
 - CP3106 Independent Project (one semester / summer)

Prerequisites

- Be an SoC student
- Have at least 60 (in-progress / completed) Units at the point of applying
- Attain a minimum GPA of 3.8.

Application Process

- Apply one semester in advance
 - Apply this semester to start your UROP in AY24/25 Semester 2.
- Secure a research project and a supervisor
- Submit your application between **7 October to 9 October 2024 (by 6pm)** via the Project Administration System at <https://mysoc.nus.edu.sg/~projadm/>

(You will be notified via email once your application is processed.)

Application Timeline

1. Acad staff to propose project	Week 6 to Reading week:	16 to 29 Sep
2. Round 1 Project Selection Exercise		
a. Discuss with potential supervisors	Week 7:	30 Sep – 4 Oct
b. Students to indicate project online after discussion with supervisors	Week 8:	7 – 9 Oct (by 6pm)
c. Staff to indicate their choice students online	Week 8 (Fri):	By 11 Oct
d. Inform both student and staff about the allocation, also update project admin	Week 9 (Fri):	By 18 Oct
3. Round 2 Project Selection Exercise		
a. Discuss with potential supervisors	Week 10:	21 - 25 Oct
b. Students who did not succeed in round 1 to indicate project online after discussion with supervisors	Week 11:	28 - 30 Oct (by 6pm)
c. Staff to indicate their choice students online	Week 11 (Fri):	By 1 Nov
d. Inform both student and staff about the allocation, also update project admin	Week 12 (Fri):	By 8 Nov
4. Manual Registration	From Week 13 to Friday, Week 1 of Next Semester	

Past Year Examples

U0791130	SciWING Scholar Document Processing Platform	KAN Min Yen
U0791140	Dataset Extraction from Scientific Documents	KAN Min Yen
U045130	Genome assembly	SUNG WING KIN
U130030	Emerging Security Problems in WebAssembly and Binaries	LIANG Zhenkai
U271050	SimBricks: modular simulation framework for end-to-end network system evaluation	LI Jialin
U148290	Active Learning for Model Robustness	LOW Kian Hsiang
U148300	Collaborative Machine Learning with Model Robustness	LOW Kian Hsiang

Finding a Project and a Supervisor

- Browse the UROP proposals via the Project Administration System at <https://mysoc.nus.edu.sg/~projadm/>
(Presentation Sem: AY2025/2026 Semester 1)
- Shortlist a few projects based on your interests and background
- Talk to the faculties for more details and get an approval from them

If You Can't Find a Suitable Project...

- Look through all project lists (UROP / FYP / CP4106, any semester)
- Find faculties whose projects / research areas are you are interested in.
- Talk to them to see if they can propose something suitable for you.

If You Can't Find a Suitable Project...

- Alternatively, [propose your own project](#) or reach out to an external party (e.g., a professor from a different faculty)
- **AND** find a faculty from SoC to supervise you (together with the external party, if applicable)

Bottom line: Take the initiative to find the best project and supervisor that fits your interests and advising style

Project Timeline

Activity	Deadlines
1. Continuous Assessment	
CA Report Submission	Wed, Week 12, Sem 1
Presentation	Reading Week, Sem 1
2. Final Assessment	
Final Report Submission	Wed of Week 12, Sem 2
Presentation	Reading Week, Sem 2
3. Additional Submissions	
Feedback of UROP Guidance and Evaluation	First Mon after Exams, Sem 2
e-copy of Final Report	

Evaluation

30% Continuous Assessment (Interim Progress Report)

15% Supervisor	30% Understanding of the problem
15% Main Evaluator	40% Technical Achievement
	10% Project and Resource Management
	20% Report and Discussion

70% Final report & Oral Presentation

35% Supervisor	20% Understanding and formulation of the problem
35% Main Evaluator	10% Extension of knowledge
	30% Methodology, Implementation and Analysis
	20% Report
	20% Effort & Initiative

If the supervisor and main evaluator agrees that the student can continue the project, you will be automatically registered for CP3209 next semester; and will receive an 'IP' grade for this semester.

Funding Support

From SoC: Up to **S\$200** per student for small amounts of computational resources, hardware, software or stationery.

- Readily available on a first-come-first basis.

From NUS: Up to **S\$2500** per student to reimburse costs for the proposed research

- Part of the Research Experience Programme (REx rolled out in this semester)
- Additional application, workshop attendance and evaluation required.

Contact Information

SoC UROP Website: <https://www.comp.nus.edu.sg/programmes/ug/project/urop/details/>

FAQ: <https://www.comp.nus.edu.sg/programmes/ug/project/urop/faq/>

Administrator: Ms Sharifah
<sha.a@nus.edu.sg>, COM1, #01-09

Thank you!

Reminder: Applications close **17 January 2025**