Warning

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

This deck is for AY 18/19 Sem I, presented on 3 Oct 2018, for prospective UROP students starting in Nov 2018.
NUS SoC UROP Briefing

AY 2018/2019 Sem I

Presented by Kan Min-Yen @ SR2
Assisted by Md Ang Jia Ying
(Revised 3 Oct 2018)
Objective

Allows undergraduates to participate in active research and to experience first hand the challenges and exhilaration of research, discovery and invention.

Typically, research involves these activities:

● Problem formulation;
● Literature survey;
● Attending research seminars;
● Proposal and implementation of solutions and their evaluation; and
● Documentation and presentation of results.
UROP @ SoC

Modules
● CP3208: Undergraduate Research in Computing I
● CP3209: Undergraduate Research in Computing II

Prerequisites
● Completed at least 60MC
● Minimum CAP of 3.8
● Approval of CS/IS department

Two Options
● 2 semester UROP: CP3208 & CP3209 (8MC)
● 1 semester UROP: CP3208 (4MC)
  ○ Can be done during summer (special term)
  ○ Can continue with CP4101 (Final Year Project)
Evaluation - CP 3208/9 Track

50% Continuous Assessment (Supervisor)
- 5% Written literature review or tutorial presentation (CP3208, around Week 8)
- 5% Written progress report (CP3208 end of semester)
- 10% Oral presentation of progress to supervisor/research group (CP3209, around Week 8)
- 30% Understanding, formulation and execution, as demonstrated throughout the project and in the progress/final reports (CP3209, end of semester)

50% Final report and oral presentation
- Two independent examiners

You get the same grade for both modules at the end of the entire project; after the end of CP 3208, you will receive an IP grade (“in progress”) that will be changed to your actual grade after the final report in CP 3209.
Evaluation - CP 3208 Track

50% Continuous Assessment (Supervisor)
- 10% Written literature review or tutorial presentation (Around Week 8, or halfway through special term)
- 40% Final Report and Overall Performance (40%) (End of semester)

50% Final report and oral presentation
- Two independent examiners

CP 3208 (UROP I) → {end} → CP 4101 (FYP)
Schedule (Sem I AY18/19)

3 Oct 2018: UROP applications open

- Put in your application form to the Undergraduate Office (Ms Ang Jia Ying)
- You will be informed when it is approved
- Once approved, get the project assignment form signed by your supervisor and hand in to Ms Ang Jia Ying

It’s recommended that you do both simultaneously

5 Nov 2018: UROP applications close
Finding Projects

Approach the faculty!

● You should look through FYP projects and ask the faculty to propose something similar.
● Talk with any faculty that whose area is of interest to you.
● Browse UROP project list at https://mysoc.nus.edu.sg/~projadm/

You can also propose your own project. You will still need to find a professor to supervise you.

Bottom line: Take the initiative to find the best project and mentor that fits your interests and advising style.
<table>
<thead>
<tr>
<th></th>
<th>Project ID</th>
<th>Title</th>
<th>Student</th>
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<tbody>
<tr>
<td>1</td>
<td>U135070</td>
<td>Cross-platform Mobile Application for Children with Autism Spectrum Disorder (ASD)</td>
<td>bhojan</td>
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<tr>
<td>2</td>
<td>U135080</td>
<td>Procedural content generation for games using machine learning techniques</td>
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<td>3</td>
<td>U024200</td>
<td>Query Reverse Engineering</td>
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<td>4</td>
<td>U024210</td>
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<td>U009050</td>
<td>Food Nutrition Disease Knowledge Graph Construction</td>
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<td>6</td>
<td>U009060</td>
<td>Food Recommendation</td>
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<td>Nudge Engine for Healthy Lifestyle</td>
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<td>8</td>
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<td>Chatbot for Newly-Diagnosed Chronic Disease Education</td>
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<td>9</td>
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<td>An Automatic Debugging Approach for Concurrent Regressions</td>
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<td>Game Theory Module based on PAT model checker</td>
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<td>11</td>
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<td>Sports Analytics using Probabilistic Model Checking and Deep Learning</td>
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<td>12</td>
<td>U011290</td>
<td>Transforming formal models of security protocols</td>
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<td>User Tracking via Machine Learning</td>
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<td>Specification Extraction Tool for Security Analysis of a Smart Home System</td>
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<td>Building an Intelligent Chatbot System</td>
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<td>Verb Duration Discovery</td>
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<td>19</td>
<td>U240010</td>
<td>Open-ended project in machine learning algorithms and/or theory</td>
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<td>Post Editing of Speech Recognition Output</td>
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<td>21</td>
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<td>Automatic Alignment of Data for Machine Translation</td>
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<td>Understanding the basis of creative use: Implications for design</td>
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<td>Entrepreneurial decision making</td>
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<td>U091250</td>
<td>A tool framework for tweaking features in synthetic datasets</td>
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<td>25</td>
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<td>Estimating round-trip time and bottleneck bandwidth for a TCP connection</td>
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<td>U230120</td>
<td>Optimizing Pipelines for Energy-Efficient AI (CNNs), Processors and Accelerators</td>
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<td>Open-ended project in Computer Architecture (Processors, AI, IoT, etc.)</td>
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<td>Building Architectures for HTAP analytical processing</td>
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<td>Developing the Foundational Principles for using Machine Learning Techniques to design Computer Architectures</td>
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<td>Improving Throughput of High-Performance Processors with Out-of-Order Commit</td>
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<td>DNA Storage Viruses, Investigating the Potential Threat</td>
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<td>Secure Query Processing on Outsourced Data</td>
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<td>Machine Learning from Mobile Devices with Privacy Preservation</td>
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<tr>
<td>35</td>
<td>U241060</td>
<td>Efficient Algorithms for Massive Graphs</td>
<td>xiaok</td>
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What is the difference between UROP and FYP?

As explained to the faculty:

Typically students selecting UROP have higher CAP (due to requirements of the programme) and more motivation towards research than FYP.

However, UROP students also usually have less background and substantially heavier workload than their FYP counterparts. UROP is only required for CS Turing programme students, who focus on research, but is open for any SoC student to take up.

UROP students typically take the 8 MC version and are expected to work the *full year*, not just term time, on their projects. Some UROP projects can extend into a follow up FYP.

FYP is a 12-MC (full year) programme for final year students. FYPs may be research-oriented, but can also be any other type of project, including implementations and team projects, which have been suitably divided among participating team members. FYP students are typically 4th year students and have fewer courses to complete, so may have more background for projects and more time.

It is required of students in the CEG programme, but is open to all SoC students. However, students from CS Department who aim for Honours (Highest Distinction) must pass the FYP.
Support

We provide the following for each UROP student:

- B&W paper quota 50 pages
- Colour paper quota 20 pages
- A1 Poster

See https://docs.comp.nus.edu.sg/node/1732

In addition, each project is given a budget of $50 for small items (claim through supervisor with receipts)
Exemptions

- For **Computer Science programme**, only students in the Turing Programme are allowed to replace CS3201/CS3202 Software Engineering Project or CS3281/CS3282 Thematic Systems Project with UROP CP3208/CP3209, under the restriction that the project contains significant programming content (subject to approval of UROP coordinator).

- For the **Computational Biology programme**, CP3208/CP3209 is allowed to replace up to two level-3 electives under the restriction that the UROP project must in the computational biology area (subject to approval of UROP coordinator).

- For **University Scholars Programme**, CP3208/CP3209 are independent study modules (ISM) which will also be counted as 2 USP Inquiry modules in Science and Technologies basket.

To apply these exemptions to your case, please approach Ms Ang Jia Ying in the Undergraduate Office for the relevant waiver forms.
Mr Quang Minh Hoàng

Although every step along the way was a trial to overcome, UROP was an enriching and transformative experience. By giving me the chance to work on cutting-edge problems, not only did UROP prepare me with ample technical knowledge in the field of machine learning, it had also helped me to obtain valuable skills such as problem formulation, problem solving and critical thinking. Most importantly, through working closely with brilliant mentors, I was able to cultivate a passion for academic research, which plays an important role in defining who I am today.

Scaling up Gaussian Process Inference for High Velocity in Big Data
Winner of Outstanding Undergraduate Researcher Prize for AY15-16
Supervisor: Dr Bryan Low
“UROP gives me the opportunity to work on an exciting cutting-edge research project. I really enjoy the meaningful experience working on the project. For those who loves challenges in doing research, UROP is the way to go.”

Mr Harta Wijaya

Statistical Machine Translation
Supervisor: A/P Ng Hwee Tou
FAQ and Issues

Q: In CORS, there is a slot for UROP lectures. What is that and what happens if it conflicts with another module?
A: For NUS modules, we sometimes have to create “dummy” modules to allow the timetabling system to mount the course. Don’t worry, there are no UROP lectures. If you find that another course conflicts with it, we can manually register you for UROP (if the UROP application was approved) bypassing CORS; please approach the UROP administrator in the undergraduate office.

Q: Is the UROP graded on the final report that we submit to the digital library at the very end of the UROP, or it is based on the report we handed in for examination? If the reviewer suggests edits then are they compulsory and accounted for in the final grade?
A: Your grade for UROP is partially based on the report that you turn in to the examiners. Unless otherwise communicated to you by your examiners or supervisor, further changes to the thesis for the archival copy in SoC’s digital library are not considered for your grade.

Q: I heard that hardcopy is no longer required for the reports. Is that true?
A: Yes. As announced on the News part of the UROP website, the workflow for reports has been recently revised such that students need to distribute their report directly to the examiners in softcopy by default. If an examiner requests hardcopy, you will be required to furnish it. The report will still need to be uploaded to IVLE for timestamping purposes.

Q: Are exchange students allowed to take part in UROP?
A: Yes, exchange students can take part in UROP. Typically since exchange is for a single semester, UROP I can be completed. Exchange students wishing to participate in UROP will need to discuss their particular schedule with their prospective supervisor.

Q: What happens if I decide to change or drop UROP part way?
A: You’ll have to defend the part of UROP that you did complete. For example, if you originally opted to do a year-long UROP, and finished UROP I, but decide to drop UROP II, you will have to defend the UROP I as your final project. Such outcomes usually do not favor the student well, so we suggest that you make a full commitment towards finishing your UROP project.
Contact Information

http://www.comp.nus.edu.sg/undergraduates/urop_project.html

Coordinator: A/P KAN Min-Yen
<kanmy@comp.nus.edu.sg>, 05-12, AS6

Administrator: Ms Ang Jia Ying
<comajy@nus.edu.sg>, UG Office

Thank you!
Reminder: Applications close 5 Nov