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Week 1: PhD ingredients

Mon, 11 January 2021 - Sun, 17 January 2021

In this week, we will have a discussion on key ingredients of PhD research: *intiative*, *intuition* and *imagination*. This will help our dialogue started, for the semester.

A video of a similar talk can be found in NUS PhD e-open day page

https://nusgs.nus.edu.sg/live-talks-playback/

(please search for the string *Abhik* in this page to locate the video).

Lecture
[L1] Tuesday, 12 January 2021, 14:00-16:00, LT19

File: week1.pptx (3.68 MB)
Re-uploading the slides for week 1 on 12th January.

Week 2: Structure of PhD

Mon, 18 January 2021 - Sun, 24 January 2021

The structure of the PhD program and research planning will be discussed in this week. The *Fish model of PhD* is discussed. We discuss the activities involved in PhD thesis writing, and by working backwards, the research planning at start of your PhD can be accounted for.

Lecture
[L1] Tuesday, 19 January 2021, 14:00-16:00, LT19

File: week2-WritingPhDthesis.pdf (2.07 MB)
Discussion notes for week 2

File: week2-Art.PhD.pdf (2.14 MB)
Reading for week 2 on Fish model for PhD.

Week 3: The skill of reading

Mon, 25 January 2021 - Sun, 31 January 2021

In this week, we will discuss the skill of reading papers, thesis, and forming a fair opinion about technical articles. This will lead us to the discussion on how to evaluate contributions of CS research, which we will delve deeper later in the semester.

We will have *hands-on reading exercise* in class, where we will read the PhD thesis introduction of NUS School of Computing PhD students. We will then share your opinions on the thesis introduction, and attempt to relate it back to research planning.

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3 PM Alumni Sharing by Dr. Shweta Shinde, Assistant Professor, ETH Zurich

Lecture
[L1] Tuesday, 26 January 2021, 14:00-16:00, LT19

File: week3.pptx (788.02 KB)
Discussion notes for week 3

File: Thesis-intro1.pdf (1.85 MB)
Sample thesis introduction (read the abstract and introduction only) to discuss in class.

File: shweta_CS_Research_NUS.pdf (37.44 MB)
Perspectives shared by alumni Dr. Shweta Shinde

File: shweta_CS_Research_NUS.pdf (37.44 MB)
Perspectives shared by alumni Dr. Shweta Shinde

Web Lecture: CS6210 Webcast Recording on 1/26/2021 (Tue)

Week 4: In conversation with PhD alumni
Mon, 1 February 2021 - Sun, 7 February 2021

In this week, we will have a sharing session with past PhD students from NUS Computer Science.

Our PhD alumni will share their frank opinion on the challenges in PhD research, as well as any improvements needed in our PhD program.

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2 PM: Alumni sharing by Dr. Marcel Boehme, Senior Lecturer, Monash

Lecture
[L1] Tuesday, 2 February 2021, 14:00-16:00, LT19

File: GAPandJobSearch.pdf (172.26 KB)
Job search measures from NUS CS department being considered

File: Thesis-intro2.pdf (1.19 MB)
Sample thesis introduction (read the abstract and introduction only) to discuss in class.

Web Lecture: CS6210 Webcast Recording on 2/2/2021 (Tue)

Week 5: Technical Contributions in CS
Mon, 8 February 2021 - Sun, 14 February 2021

In this week, we will have a discussion on technical contributions in CS. We will take examples of signature Turing award winning contributions. To discuss:

[*Transplantation* style contributions] Temporal Logics by Pnueli.

[*Cross-fertilization* style contribution] Model checking by Clarke, Emerson and Sifakis.

[Assignment 1 is posted in this week. It is due on March 1st.]

Lecture
[L1] Tuesday, 9 February 2021, 14:00-16:00, LT19

File: week5.pptx (1,021.41 KB)
Discussion notes for week 5

File: week5-ContributionsTuringAward papers.docx (13.27 KB)
Summary of Turing award winning contributions discussed in week 5.

File: TemporalLogics.pptx (132.20 KB)
Detailed notes on the first Turing Award winning contribution discussed in week 5.

File: ModelChecking.pptx (110.33 KB)
Detailed notes on the second Turing Award winning contribution discussed in week 5.

File: Assignment1.pdf (64.89 KB)
Assignment 1 posted (PDF file).

File: clarke.pdf (1.35 MB)
Turing Award winning contribution, paper in 1981, Turing Award 2007.

File: pnueli_temporal_logic_of_programs.pdf (1.45 MB)
Turing Award winning contribution, paper in 1977, Turing Award 1996.

Web Lecture: CS6210 Webcast Recording on 2/9/2021 (Tue)

Week 6: Systems building research in CS
Mon, 15 February 2021 - Fri, 19 February 2021

We will continue the discussions from week 5 on Turing award winning contributions.

This will be followed by discussion on a sample paper to show how systems building research can be planned for greater impact. Sample paper discussed in class: KLEE paper OSDI 2008.

Lecture
[L1] Tuesday, 16 February 2021, 14:00-16:00, LT19

File: klee-osdi-08.pdf (222.67 KB)
Reading for week 6

File: klee-stanford-2009.pdf (447.76 KB)
Reading for week 6

File: week6.pptx (999.35 KB)

Web Lecture: CS6210 Webcast Recording on 2/16/2021 (Tue)

Recess Week
Sat, 20 February 2021 - Sun, 28 February 2021

Week 7: Choosing your own path in CS
Mon, 1 March 2021 - Sun, 7 March 2021

Suppose you have several ideas in mind, how do you choose? How to distinguish between a one-off idea and a solid direction in Computer Science? In this week, we will engage in discussions on this topic, with specific examples, and points of caution to watch out for.

[Assignment 2 is given out, it is due in week 11.]

Lecture
[L1] Tuesday, 2 March 2021, 14:00-16:00, LT19

File: week7-CS6210PlanningaResearchProject.pdf (112.84 KB)

File: week7.pptx (1.11 MB)
Changed the lecture slides for Week 7, slightly.

File: Assignment2.pdf (24.21 KB)
Assignment 2 is being posted.

Web Lecture: CS6210 Webcast Recording on 3/2/2021 (Tue)

Week 8: Sharing of Research Experience
Mon, 8 March 2021 - Sun, 14 March 2021

We will share personal research experience and de-construct it, to evolve and construct the genesis of ideas and positioning of ideas.

The discussions will involve:

- *setting the stage:* the stage the research community was in when the papers were published

- *metamorphosis*: how the paper(s) transformed the research community

- *post-mortem*: analysis of why the papers were successful and what could have been done differently.

[Assignment 3 is given out, Presentations in week 9, 10]

Lecture
[L1] Tuesday, 9 March 2021, 14:00-16:00, LT19

File: Summary.pdf (333.07 KB)
Summary of some key points in research planning - put together in one slide deck.

File: Assignment3.pdf (72.23 KB)
Posted. The presentations will be in class in week 9 and week 10, please note.

File: week8.pptx (5.39 MB)
The last slide contains our discussions in class.

Web Lecture: CS6210 Webcast Recording on 3/9/2021 (Tue)

Week 9: Student led presentation and peer-review
Mon, 15 March 2021 - Sun, 21 March 2021

Students of the class will present a paper of their choice and de-construct it. The presentation will be peer-reviewed by remaining students of the class.

The presentations are planned to be in groups, if possible.

Lecture
[L1] Tuesday, 16 March 2021, 14:00-16:00, LT19

Week 10: Student led presentation and peer-review
Mon, 22 March 2021 - Sun, 28 March 2021

Students of the class will present a paper of their choice and de-construct it. The presentation will be peer-reviewed by remaining students of the class.

The presentations are planned to be in groups, if possible.

Lecture
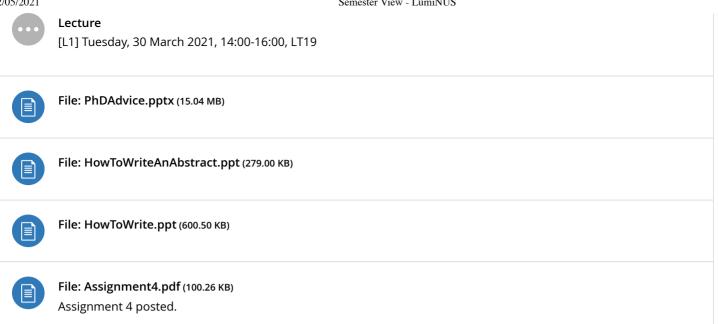[L1] Tuesday, 23 March 2021, 14:00-16:00, LT19

Week 11: The skill of writing and presenting
Mon, 29 March 2021 - Sun, 4 April 2021

In this week, we discuss some tips for giving high quality talks to disseminate your research. We also discuss tips on writing papers. We also discuss general advice w.r.t PhD program to complete discussions.

[Assignment 2 is due, Assignment 4 is given out this week]

Lecture
[L1] Tuesday, 30 March 2021, 14:00-16:00, LT19

File: PhDAdvice.pptx (15.04 MB)

File: HowToWriteAnAbstract.ppt (279.00 KB)

File: HowToWrite.ppt (600.50 KB)

File: Assignment4.pdf (100.26 KB)
Assignment 4 posted.

Week 12: Student led discussion on CS research directions
Mon, 5 April 2021 - Sun, 11 April 2021

In the last 2-3 weeks, the students will attempt to pitch a research direction in an attempt to get practice in handling interviews.

This presentation is planned to be an individual presentation.

Lecture
[L1] Tuesday, 6 April 2021, 14:00-16:00, LT19

Week 13: Student led discussion on CS research directions
Mon, 12 April 2021 - Fri, 16 April 2021

In the last 2-3 weeks, the students will attempt to pitch a research direction in an attempt to get practice in handling interviews.

This presentation is planned to be an individual presentation.

Lecture
[L1] Tuesday, 13 April 2021, 14:00-16:00, LT19

Reading Week: Continuation of student led discussion
Sat, 17 April 2021 - Fri, 23 April 2021

In the last 2-3 weeks, the students will attempt to pitch a research direction in an attempt to get practice in handling interviews.

This presentation is planned to be an individual presentation.

[Written part of Assignment 4 is due at the end of this week]

Examination Week
Sat, 24 April 2021 - Sat, 8 May 2021