

SWS3004: Cloud Computing with Big Data

School of Computing Summer Workshop: 5-25 July, 2019



Teo Yong Meng 张永明

Room: Com2, #04-39

Department of Computer Science

National University of Singapore

Email: teoym@comp.nus.edu.sg

URL: www.comp.nus.edu.sg/~teoym

Tel: 6516 2830



My Interests

Research: modelling (simulation and performance modelling), parallel computing (cloud, edge)

Teach: Parallel Computing, Cloud Computing, Computer Systems Performance Analysis, ...

Best Paper Awards

1. L. Birdsey, C. Szabo and Y.M. Teo, **Twitter Knows: Understanding the Emergence of Topics in Social Networks**, Proc of Winter Simulation Conference, IEEE Computer Society Press, US, Dec 6-9, 2015. **[WSC 2015 Best Paper Award]**
2. M. Mihailescu and Y.M. Teo, **Strategic-Proof Dynamic Resource Pricing of Multiple Resource Types on Federated Clouds**, Proc of 10th International Conference on Algorithms and Architectures for Parallel Processing, Busan, Korea, May 21-23, 2010. **[Best Paper Award]**
3. C. Szabo, Y.M. Teo and S. See, **A Time-based Formalism for the Validation of Semantic Composability**, Proc of the Winter Simulation Conference, pp 1411-1422, IEEE Computer Society Press, Austin, Texas, USA, December 13-16, 2009. **[ACM SIGSIM Best PhD Student Paper Award]**

Outline

- Learning Objectives
- Course Organization
- Projects
- Module Assessments
- Course Schedules & Webpage
- Main Text

Cloud Computing with Big Data



What is Cloud Computing?

Program is an **Internet (cloud) service**

and

platform are **datacenters**

[AliCloud's New Eco-Friendly Green Data Centre,](#)
Nov 2015 (Youtube, 4.12min)

Why Cloud Computing?

- Cloud has moved beyond **disrupting IT** to provide the basis (cloud-enabled platform services) for future digital disruptions and **innovations**
- Next wave of cloud disruption **delivers advanced capability** around AI, blockchain, IoT among others

Learning Objectives

1. Explains and discusses fundamental aspects of cloud computing **concepts, models, technologies** and **applications**; cloud-enabled data analytics with discussion on **big data architecture** and **patterns**
2. Project
 - design and implement a cloud application with advanced capability such as data analytics, AI, etc
 - deliverable: functional prototype with source code
 - IBM Bluemix Cloud, Watson (AI) services, etc

Course Organization

1. Introductory lectures
2. Project lectures
3. Project discussions, guided labs and milestones
4. Visit to a datacenter

Lectures

Introductory Lectures

- **Lecture 1 (3-hr)**
 - L01: Introduction
 - L02: Concepts & Models
- **Lecture 2 (3-hr)**
 - L03: Applications & Paradigms
 - L04: Projects

Project Lectures

- **Lecture 3 (3-hr)**
 - L05: IBM Cloud Services
 - P01: IBM Cloud Services – Lab I
- **Lecture 4 (2-hr)**
 - P01: IBM Cloud Services – Lab II
- **Lecture 5 (2-hr)**
 - L06: Big Data Architecture & Patterns
- **Lecture 6 (2-hr)**
 - L07: Technologies behind Cloud Computing

Projects

- 2-4pm, Thu, 11 Jul Project Discussion
- 9-11am, Sat, 13 Jul Milestone 1: Pitch & Buy-in
- 2-4pm, Mon, 15 Jul Milestone 2: Design Walkthrough
- 9-12noon, Fri, 19 Jul Milestone 3: Prototype Walkthrough
- 9-12noon, Tue, 23 Jul Milestone 4: Poster Presentation & Demo
- Thu, 25 Jul Showcase Day

SWS3004 Prizes: best innovation, best implementation and best overall

Possible Projects

1. Image recognition – facial expression recognition, human-machine communications with emotion, ...
2. Data analytics – personality insight analytics, personal internet footprint, dynamic car park pricing, ...
3. Chat box assistants in various contexts
4. Serverless application as a service
5. Visualization of MRT, Train, bus network fares
6. ...
7. Self propose – please discuss with me

discuss further tomorrow!

Module Assessment

- Lab (30%)
- Project (70%)
 - Milestone 1: Pitch and Buy-in 10% + 5%(peer evaluation)
 - Milestone 2: Design Walkthrough 10%
 - Milestone 3: Prototyping Walkthrough 15%
 - Milestone 4: Poster Presentation & Demo 20% + 10%(peer evaluation)

Course Schedule & Webpage

- Webpage:
 - LumiNUS for course announcement
 - www.comp.nus.edu.sg/~teoym/sws3004-19 for course schedule, slides, consultation hours, etc.
- Venue: 5 & 6 Jul lectures @ LT16, after that all activities (lectures, consultation, project workspace, ...) in **SR10**
- Tutor: Sunimal Rathnayake (Com 2, #B1-01)
Zhang Han (Com2, #B1-01)



Main Text

- *Cloud Computing: Concepts, Technology & Architecture*, Thomas Erl, et al., Prentice-Hall, 2013, 2 copies available for loan

