CMPE 48A – TERM PROJECT

Submission Deadline: 04.01.2022

You have two options for the term project.

Option A (Simulation Experiments):

You can focus on a cloud computing data center scenario. Define a problem and run simulation experiments to obtain results.

One example topic: Evaluation of VM migration algorithms. You can check out this paper to see how such algorithms might be. https://journalofcloudcomputing.springeropen.com/articles/10.1186/s13677-015-0045-5

As a simulator, you can use one of the below given simulators.

- CloudSim https://github.com/Cloudslab/cloudsim (v 3.03 is easier to use than the latest version)
- FlexCloud https://sourceforge.net/projects/flexcloud/
- iCanCloud https://www.arcos.inf.uc3m.es/old/icancloud/Home.html
- PICS https://cobweb.cs.uga.edu/~kim/PICS/ (Unlike above simulators PICS is written in Python. However, it is based on Python 2.7 and couple of outdated libraries)

If you want to use another simulator, please contact the course instructor.

If you choose this option, you are expected to submit:

- A four-page report written in IEEE conf. template explaining your problem definition, experiment configuration, algorithms and results.
- Your code (if you needed to write extra code to run your scenario)

Option B (Practical Implementation):

Implement a practical Cloud Computing application.

Your work need not be a full-fledge application but an application component focusing on a certain facet of the problem.

You can use open-source software to enable realistic testing in your projects. For example, if your project is about container orchestration, you can use an existing open-source web/mobile

application and run it on your system to play with container orchestration configurations.

You can work in groups of max 2.

Here are some topics to inspire you. Exact details of your project should be defined by you.

- IoT Cloud Applications
- Containerized Applications
- AI services over Cloud (AIaaS) → Many many services exist, wide range of implementation possibilities!
- PaaS Application Development
- Industry 4.0 cloud applications
- IaC (Infrastructure as Code) Terraform, CloudFormation
- Gaming Applications: You can use an open-source games to implement cloud gaming in your project.
- Web & Mobile App Development and/or Testing
- Cloud Storage Services
- Serverless Computing
- Load Balancing
- Scaling tests (vertical and/or horizontal)

Tools for implementation:

You can either use virtualbox or free services from cloud providers.

Cloud Services:

You can check out well-known cloud service providers to see what available services you might use in your projects. You must be careful, some of these services have free trials and some of them don't. You are advised to use services with free trials. **Be extremely cautious: when free limit is finished you may instantly be charged!**

https://cloud.google.com/products

https://aws.amazon.com/products/

https://azure.microsoft.com/en-us/services/

https://www.ibm.com/cloud/products

This is not an exhaustive list, you can find similar products and services

Submission files: A demo, code on github, a short report ~2pages long in IEEE conference template format.