DS - Project Instructions

September 3, 2018

1 Important weeks

- Project Reports on weeks: 6, 9, 12
- Final Demo on week 15
- Final Reports submission on week 16

Normally, the presentation will occur during the seminar session or if there is any change it will be announced on the course website: 'https://courses.cs.ut.ee/2018/ds/fall'

2 Objectives

The aim of this class project is to conduct research, design, build and test or experiment with a working real-world distributed system, or algorithms in a suitable simulation. This document will provide example ideas (below), but you can also propose your own project idea. Hence, you should select a project in such a manner that you build prototype can be completed by the end of the semester. The general purpose is to apply all the knowledge acquired from the lectures and your personal research to produce a high-quality mature system. Besides, you are allowed to use any programming language or platform; however, you should take into account that the instructor and TA’s expertise may be limited depending on the language you selected. With this respect, the instructors and TA’s will do their best to support you and help you during the workshops and discussion sessions.

2.1 Building the teams

During this project, you have to work in teams. Therefore, the total number of the team’s members is 5. In addition, you have to elect a leader that will represent your Team and manage it. During the presentations, we are expecting the participation of all the team’s members.

2.2 Project Stages

1. Project proposal
2. Project reports
3. Final Demo
4. Final Report

2.3 Project proposal

The project proposal will be in the form of a short presentation of 5-10 minutes by each Team in Class during the workshops and discussion sessions. (Week 3)

The presentation should include the following information:

1. A Title
2. Team members
3. A clear description of your idea
4. Initial related work or similar projects
5. Workflow of your adopted approach
6. Workload distribution among team members
7. Your testing plan or strategy
8. Link to your bitbucket repository where you will manage the source code of your project among your Team and you will be evaluated individually based on your contribution.

During the presentation, you will receive questions and feedbacks and you have to take them into account. A revised presentation based on the feedback has to be submitted to the course website via this link: 'https://courses.cs.ut.ee/2018/ds/fall/Main/Seminars'
The proposal is not subject to grading, but you should take it seriously as a mean to help you in the process of building up a successful project.

3 Project reports

Project reports will be in form of a 20 minutes presentation by each Team roughly every 3 weeks. The presentation should cover the approaches developed and the problems faced during the process. After, each presentation they will be a discussion session. Progress reports are graded and they will constitute 20% of the final grade.

4 Final Demo

Final Demo is about a presentation and demonstration of the system created of 15 minutes, where each Team has to present. The presentation should cover mainly the following topics:

- Project Title, Team member
- Objectives and goals
- Description of Distributed systems challenges addressed
- Related work
- Major design and architecture
- Demonstration of the system
- Testing and evaluation
- Reflection about the results
- Conclusion, lessons learned and future work

5 Final report

The final report is a written document that summarizes and explains the all the stages done during the implementation of the project. The reports should at least contain the following information:

1. Project Title, Team member names
2. Objectives
3. Description of Distributed System challenges addressed
4. Related work
5. Major design decisions
6. Implementation details
7. Analysis of expected performance (growth rate of major algorithms, etc).
8. Design of performance testing
9. Testing results
10. Conclusions, lessons learned possible improvements, etc

6 Example project ideas

This is just examples of ideas but you can choose with your team whatever project you have in mind and TAs are here to help you in your decision and in the process of selecting an appropriate topic for your project.

1. Shared document editing, in the style of Google Docs. The system should support real-time editing and viewing by multiple participants concurrently.
2. Real-time multi-player game. The game with shared state (battlefield, map etc.) constantly modified by several players.
3. An airline reservation system. Each airline would maintain its own collection of servers, with enough state replication to enable automatic fail-over.
4. Streaming video in a peer-to-peer network (there are no definite stream-severs, here peers can stream video from other peers, peers do not necessarily have complete videos, peers assemble the stream from many blocks offered by other peers).
5. A low-latency notification system. E.g., watch a whole bunch of RSS feeds and send all subscribers an email when one is updated.
6. Implement a distributed file-storage that offers basic redundancy (at least 2 storage elements) and fault-tolerance (client’s data should not be lost in case of failures on 1 storage element).
7. Secure peer-to-peer instant messenger

7 Deliverables

- Project proposal
- Project reports in presentation format (3 presentations in total)
- Final demonstration (Demo)
- Final report (Document about the project)

8 Grading

The project will be graded as follows:

1. Project reports: 20%
2. Final Demo: 50%
3. Final Report 30%