# METU, Department Of Computer Engineering

# Graduation Project

# Proposal Form

***\* \* \* This Part is for guidance and to be deleted from your proposal \* \* \****

*(Please read carefully, and follow the instructions to prepare the project proposal form.)*

*(Instructions to fill in this form are given in italic fonts and in parentheses. These instructions should be replaced by relevant information to provided.)*

*(To provide an input for a section of the form, delete the instruction and provide your input in place of the deleted instruction. In the final form that you will submit, there shouldn’t be any instructions left over, including this section of the form.)*

*(If you feel that a particular instruction is not relevant to your project proposal, please use a proper explanation for this, rather than ignoring the instruction.)*

*(The final form should not exceed 4 pages, excluding this page and including the References section. Please use Arial, Normal, 10pt fonts and single line spacing.)*

*(Please follow these instructions carefully to improve the quality of your proposal.)*

### Important Notes

A project could be proposed by (i) a student group, (ii) a company, or (iii) a faculty member of the department by filling in this form and submitting it to [49x-proposal@ceng.metu.edu.tr](mailto:49x-proposal@ceng.metu.edu.tr) by e-mail. For a project proposal, there might be a sponsoring company supporting the project and providing some form(s) of resources for the project.

Each project will be carried out by a group of 4 students over the course of 9 months, which amounts to 36 man\*months. It is very important that your project's workload is around 36 man\*months. Please make sure that you have a rough justification about the workload of the project.

If your proposal might contain a patentable idea or any type of intellectual property, please first make sure to follow appropriate steps (apply for a patent, etc.) before sending your idea to us. Once this form is received from you, the instructor(s) and the department has no responsibility regarding to intellectual properties of your project/idea.

All sources and documentation developed for this course are assumed to be public domain (GPL, CC or similar license) by default. If you need any exception for license and disclosure of project work, please specify this in detail in IP section of the form.

Please note that source codes, documents and issue tracking should be kept in department servers. No restrictions can be requested for limiting faculty and assistants access to student work.

## Project Information

### Title

Algorithmic Trading Framework

### Target

Public [ ] Restricted [ X ]

AlgoTrading People

### Proposer Information

|  |  |
| --- | --- |
| Name(s) | 1. *(P* Ünal Akünal |
| E-Mail(s) | 1. *(P* e2035574@ceng.metu.edu.tr |

### IP (Intellectual Property) Information

All intellectual property rights belong to the group members and the advisor.

## Project Description and Background Information

### Description

This project aims to provide a general framework in order to create a pipeline for creating, testing and optimizing trading algorithms. The application will be web-based for being easily accessible, user-friendly, and easy to start for the users. Three main components can be further defined as follows:

a) Algorithm Creation Interface: This supports composing an algorithm from different indicators, using graphical user interface bindings.

b) Back Testing Client: This allows users to test their algorithms against previous real-world data, fetched from various sources.

c) Optimization & Feedback: The parameters used inside the indicator are optimized using various machine learning techniques to give the user feedback about his/her system.

### Similar Products/Projects

QuantConnect (<https://github.com/QuantConnect/Lean>)

A browser based trading software, but coding skills are required to build and test algorithms.

PyAlgo Trade (<http://gbeced.github.io/pyalgotrade/>)

Just a library for python, again coding skills and Python knowledge is required.

Also note that the closed source versions of these kinds of projects are owned by corporations.

### Justification of the proposal

1. In algorithmic trading process it is hard to find a software that enables testing and optimizing properly. The web based development will allow users to access the system any time, anywhere.
2. The user friendly interface will let people without the vast knowledge of algorithms or coding to be able to test their ideas on their browser.

### Contributions, Innovation and Originality Aspects of the Project

In national level, there exists no project that has the similar scope with our work. Pipelining different needs for trading process is also something new in the international level. Even there may be likes of those in the closed-source form, there is no open-source, web-based system for this process. The availability feature is mainly what differs our system from others.

Also the abstract nature of the software will be in such a way that expanding the financial indicators will be fairly easy with just a bunch of new data sources. In that sense, the project may not be limited to algorithmic trading but any other mediums with similar dynamics and characteristics.

### Technical Aspects of the Project

The creation part will be done in the web based front-end, which will communicate with the back-end. Also the optimization and testing parts will be handled in various services that take place in our servers.

### Targeted Output, Targeted User/Domain Profile

Targeted user profile is the people who have the beginner to advanced knowledge about algorithmic trading.

Target: Serving the application on the cloud.

### Project Development Environment

The front-end side will be developed in JavaScript, ReactJs etc. The back-end development will be done in various languages such as C++, Python or Java if necessary. The optimization part will be done using open-source machine learning library, such as Tensorflow and Keras.

### External Support

1. *(List any required hardware and software support for your project.)*
2. *(List and describe the resources provided by a sponsor -if any.)*

*(Do you plan to utilize external support including know-how, consultancy services, etc. for some minor parts of the project?)*

### References

[*https://www.tensorflow.org/*](https://www.tensorflow.org/)

[*http://gbeced.github.io/pyalgotrade*](http://gbeced.github.io/pyalgotrade)

[*https://reactjs.org/*](https://reactjs.org/)

[*https://github.com/QuantConnect/Lean*](https://github.com/QuantConnect/Lean)

[*https://keras.io/*](https://keras.io/)