

# PIRE 2009 Project Proposal

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**Supervisor's Name and Title at the PIRE International Partner's Institution:**

Dr. Jijiang Yang and Dr. Yong Zhang

**Project Title:** Utilizing web-services and new artificial intelligence methods to predict financial market trends.

**Problem Statement:** I plan to combine web-services, genetic algorithms, and neural networks to predict financial market trends. The web-services will gather data that will be imputed into a new combination of AI methods (the combination of genetic algorithms and neural networks) to predict financial market trends.

**Motivation and Impact:** Lately the financial world market has decreased significantly I feel this new AI method will be extremely efficient in solving problems (in this case the stock markets, etc). If the AI method is successful, "test" data could be inputted, to see the reaction of the financial markets if an event occurred, for example, a company CEO dies. If that happened how would their stock be affected? This program could analyze that occurrence, and will be designed to included many other events, as well as a way to create new types of events.

**Current Status:** I have already created a basic version of the program that only utilizes standard artificial intelligence algorithms. The program has been written in C# (pronounced "C sharp"). The small version of the program will serve as a road map to create a much more detailed, and efficient program.

The new program will be expanded from the original program to included Web Services. These services will be designed to "crawl" the web looking for information that affects the financial markets, so that algorithms can take into account real world events, rather than just pure numbers. These services will fit into PIRE's research projects via the "Data Mining", "Autonomic Resource Management" and "Visualization Software Tools" boxes.

**Research Roadmap:** Firstly, I can see two papers already. The first paper will come from the creation of the new AI method. The second paper will come from the new way of utilizing web-services. In addition there could be more paper topics that arise from this project that do not see at the moment.

**Research Time Line:**

- Neural Networks: How to combine them with genetic algorithms. This part of the research is extremely significant since it is the backbone of the program, it will most likely last one month, followed by a week or two of creating the algorithm.
- Web-services: I have already had a bit of experience with web-services, but I will have to research how I can adapt them into a “web crawler.” This research will probably last two to three weeks, followed by a week of programming the web-services.
- Front end design: I will have to design the user end of the program, and interlace it with both back ends, this will most likely last one or two weeks.
- Paper writing: At the end of each major milestone that has significance to become a paper, I would temporarily pause my research, to write the paper for that segment. I assume each paper will take one to two weeks, depending on the length of the paper.
- Finalization: Last minute touches to the program, I assume this will last at least a week.
- Unforeseen obstacles: I am giving myself a good amount of wiggle room, as in this type of research and program design there are often bumps along the road that can hold a project back. I am allotting one month for these issues.

That brings the total project time (assuming two papers) to be between four and six months. I plan to begin this work as soon as I hear from PIRE. I understand that I will only have two months overseas, which is why I plan to begin work before I leave the United States, and most likely wrap everything up after I come back.

**Relation to PIRE Core Research Projects:** This project fits into several “boxes” which can be found at <http://pire.fiu.edu/research.php>. The first box it fits into is “Data Mining Software Tools,” the web-services I will implement as a “crawler” which will search for relevant data on the web. The second box this project fits into is “Visualization Software Tools,” the front end of the program I will design will display detailed visual information, suitable for any user, as well as include options for a more advanced user. The third box my project fits into is “Autonomic Resource Management,” the data collected by the web-services will be managed by the newly designed AI methods.

**Final Note:** This project may be expanded or slightly scaled down during the research portions to more adequately and accurately predict financial market trends.

**Thanks:** Thank you to Dr. Huang for introducing me to this project. I hope you found my proposal interesting and worthy of acceptance into your prestigious PIRE program.