The Laboratory „PC-Pools and Network" (13. floor)
Offers the following

Master Projects

I. Database backed Internet Whiteboard

The idea: creation of a whiteboard in web format which enables the administration to publish short term status information in the internet as for example lectures not taking place due to illness and so on. The whiteboard should have two easy to use interfaces, one for authorized staff to change data using WORD document or another easy to use text-based frontend and the output web page for student use.
Password authorisation, automatic deletion and date/time handling has to be implemented. Each of the different categories is attached to a graphical icon or identification. So the whiteboard includes the possibility to add and manage in an easy way additional categories.

Software: The application should use a Database to store the contents, preferred MySQL. Tomcat and JSP or PHP and / or Perl should be used as scripting language. The interfaces for I/O may be WORD or another self implemented text based program.

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II. Business budget client/server management application using MySQL

The idea: The department has a business programme to fill in the order forms which is based on Visual Foxpro. This programme has to be redesigned and transferred to a data base based client/server application. All laboratories have their own budget and handle their orders. Each laboratory has a lot of fixed companies where they order articles. These fixed companies as well as the new ones have to stored in the database together with the important information to fill in automatically the order forms and as well the articles bought in the past. In addition several views have to be generated to get a general overview for an easy ordering of articles.
Constructing a good data base model for the application and a multi functional order I/O programme for easy usage including help functions etc. is the main task for this project. The I/O programme may be either a Client frontend (Windows or Java) or a webserver application.
As well a basic view for the business committee has to be implemented together with all necessary overview. The next step may be a data exchange with the SAP R/3 application of the university.
Pre-condition :
  -   understanding the existing programme for order forms
  -   studying the business related literature
The software can be written on each compiler. A JAVA based realisation is preferred. A usable data base can be MySQL.
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III. Recurrent Neural Network and Prediction for Weather Data

The idea : predict some or more weather data like wind speed and direction, temperature, barometric pressure etc. for a period of one or more days using recurrent neural network technology.

Pre conditions :

- understand the neural network technology (looking for literature)
- understand and analyse the data measuring of the weather data (reading handbooks)

Analysis and requirements :

- identify the structure of the neural network topology
- identify a learning algorithm for the neural network (e.g. backpropagation)
- identify the different software requirements for neural network implementation and displaying the results
- find the best situated language for the implementation (JAVA or C++ or others)
- line out a project plan

Design and realization of the software including the test.

Documentation of the results.

References :

- Rummelhart DE, Hinton GE, Williams RJ, "Learning Internal Representations by Error Propagation", Nature 323, p. 533-536, published in Andersson and Rosenfeld 1988, Rummelhart 1988a, cap. 8
- Sterzing V., Schuermann B., "Recurrent neural Networks for temporal Learning of Time Series", International Conference on Neural Networks, New York, IEEE 1993, p. 843-850, ISBN 0-7803-0999-5
- Ritter H, Martinetz T., Schulten K., "Neuronale Netze. Eine Einfuehrung in die Neuroinformatik selbstorganisierender Netze", Addison--Wesly, Germany,1991
- Hotop, Lechner: In-Flight Wind Prediction using Recurrent Neural Networks, Paper and Presentation during the EANN 97
- Proceedings of the EANN 97 and following years
- other literature of neural networks

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IV. Cloud Analysis of Satellite Weather Images

The idea: a satellite antenna at the top of the building receives weather pictures. The data are stored by a special software on files and a database holds data of the percentage of cloud covering. There are some first experiences in single cloud detection and their moving using statistical methods. The goal is to evaluate the wind speed and direction in different heights analysing the cloud moving. This includes cloud detection algorithm and refind the clouds in the following image.

The result has to be displayed on the internet together with the existing weather image side.

Pre-condition :

- understanding of graphic formats (looking for literature)
- algorithm of probability calculus (literature)

The software has to be written in JAVA or C++. The results shall be stored on a database (MySQL). All internet based parts can be implemented using JAVA, PHP and / or Perl.

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