GeoNeurale

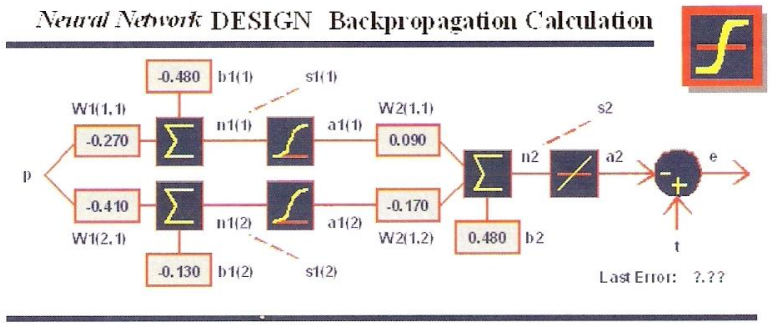
announces

The Logic of Neural Networks for the Petrophysical, Seismic and Facies Estimation

GATE – Garchinger Technologie und Gründerzentrum

Munich

Germany



A new window into the future of the scientific research

Apply the language of nature to develop new interpretation methods

The Logic of Neural Networks for the Petrophysical, Seismic and Facies Estimation

MUNICH

at the

GATE – Garchinger Technologie und Gründerzentrum

3 DAYS COURSE

INSTRUCTORS: Dr. Hansruedi Früh , D. Ing. Tino Perucchi

The Group of Artificial Intelligence and Neural Networks , Zurich - Switzerland / Munich - Germany

AUDIENCE: Research Geoscientists, Modeling Specialists, Petrophysicists, Seismologists, Geophysicists, Team Leaders, Managers, Scientists involved in Reservoir Characterization and Interpretation Systems.

The first two days will be also useful for Scientists of other disciplines who intend to develop their understanding of these specific Neural Networks Logic Systems for interpretation methods.

ONLINE REGISTRATION: www.GeoNeurale.com

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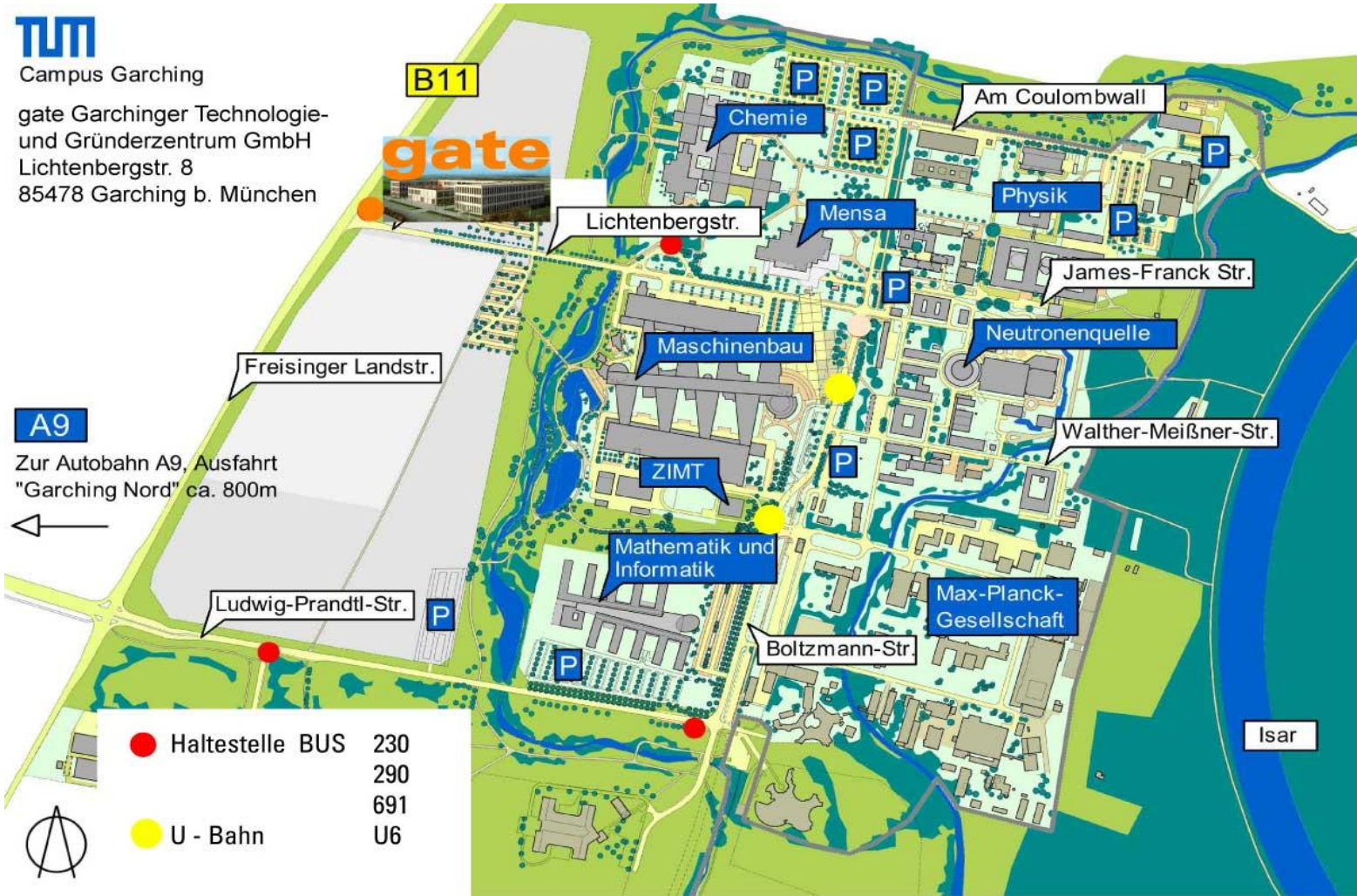
GeoNeurale

Office and Training Location



The Logic of Neural Networks for the Petrophysical, Seismic and Facies Estimation

Neural Networks applications will not substitute the deterministic and stochastic approach in the petrophysical and seismic analysis for reservoir characterization but they will be more and more a powerful integration where uncertainty leave open solutions for multiple realizations.

Neural Networks applications are not only a tool to assist parallel or alternative interpretation in Petrophysics, Revervoir Characterization,Seismic Attributes Analysis but reveal more and more a huge potential for support applications in Geostatistical Analysis.

For this reason the logic behind the Hebb, Hopfield and particularlythe Kohonen networks are important to be integrated in many applications not only as a ready-to-use program which the user can find in commercial software products but also as a tool that every Geoscientist should be capable to apply and adapt independently and integrate in the logic of his interpretations routines. The Geoscientist should also be aware of the multiplicity of applications and immense capabilities that these logical systems offer as support to the traditional interpretation methods.

The Logic of Neural Networks for the Petrophysical, Seismic and Facies Estimation

This course sets a strong basis in neural networks logical systems and describes the importance and functionality of these methodologies for reservoir characterization purposes.

The Course is developed in 3 days lessons.

In each day a different types of neural networks will be presented.

The first day deals with the presentation and description of

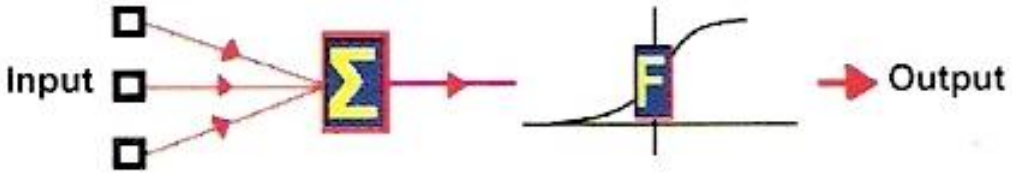
Hebb and Hopfield Neural Networks.

The second day deals with the presentation and description of Kohonen and Backpropagation Neural Networks.

The third day will be concentrated on practical exercises and the participants are encouraged to discuss their own applications and case studies.

The participant will learn the practical use of the Neural Networks applications and also learn, after theoretical and practical demonstrations, to test the behaviour of neural Networks with computer programs and to influence their behaviour.

As a practical example, data of the participants can be read from a text file and input in a simple standalone program and processed from a Backpropagation network in order to show the desired output that can be written back to a second text file.



A temporary, 10 days license of MatLab will be installed in each student´s computer to allow her/him to Program and customize her/his own applications to solve the exercises and each individual interpretation problems

PROGRAM

The course provides a strong foundation in the logic of principal types of Neural Networks and particularly those that find an application in the Reservoir Characterization and Interpretations Methods.

The Program is divided into several chapters. Each of them describes a different kind of Neural Network which is then explained in details through exercises and practical applications allowing the participant to interactively learn the principal algorithms, functions and mechanisms ruling all the logical systems.

- Introduction: The Biological foundations of Neural Networks
- Definition of Neural Networks
- Biological Inspiration
- Principles of Neural Networks
- Types of Neural Networks
- Networks Functions
- Hebb-Networks
- Hopfield-Networks
- Kohonen-Networks
- Learning on the Error Basis
- Backpropagation-Networks
- Bayesisan-Networks
- Applications
- General Industrial Applications
- Examples of Applications in the Reservoir Characterization and Interpretation - Discussion

BIOLOGICAL FOUNDATIONS

The Brain Structure and Organization

The Nervous Cell Structure

Logical Principles

Types of Neural Networks

Networks Functions

Transfer Functions

Output Functions

Learn and Test Phase

HEBBS NETWORKS

Networks Structures

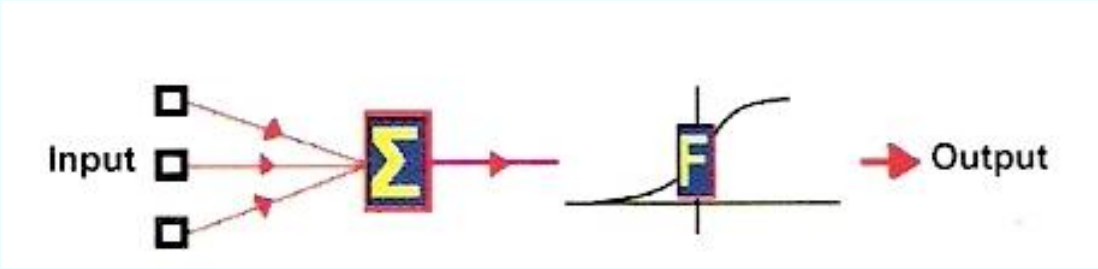
The Hebbs Learning Rule

The Hebbs Advanced Learning Rule

Hebbs Networks that Forget

Applications

Practical Exercises with MatLab



HOPFIELD NETWORKS

Autoassociation

The Hopfield Model

Visual Representations examples

The search of the Minimum Energy Function

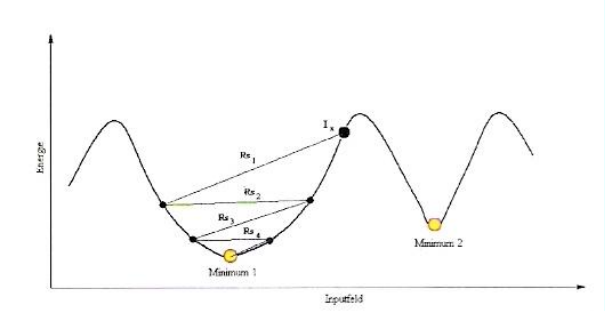
Forms recognition with Hopfield Networks

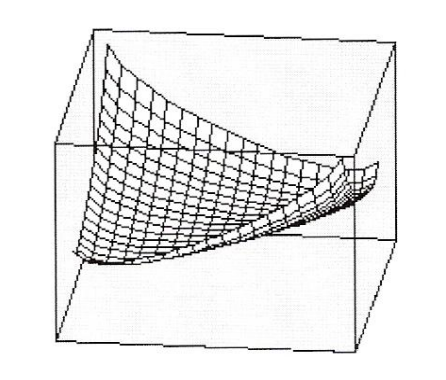
Learning Process and Energy Function

Calculation of Synoptic Weights

Continuous Hopfield Model

Practical Exercises





KOHONEN NETWORKS

Autoorganization models in the Brain

Cortical Columns and Brain Fields

Principles of the Topographical Arrangement

Neighbourhood Activation Principles

Activation Functions Types

Practical Exercises

PERCEPTRONS AND BACKPROPAGATION NETWORKS

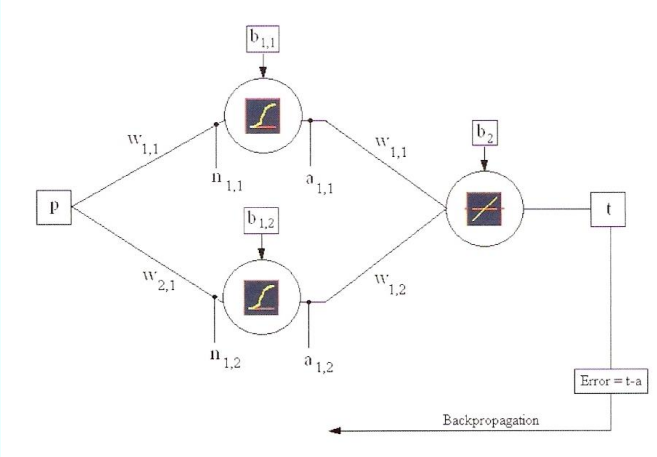
„Learn from Errors“ Principles

The classical Perceptron

Transfer Functions

Learn Functions

Multi Layers Perceptrons



Backpropagation Networks

Transfer Functions

Learn Functions

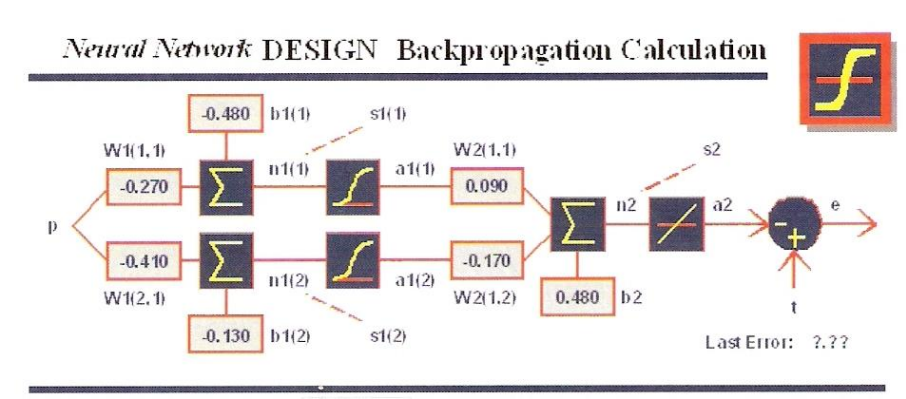
Test Phase

The Delta Learn Rule

Momentum

Practical Exercises

Object Recognition

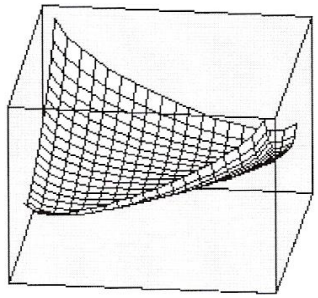


APPLICATIONS TO THE ESTIMATION AND CLASSIFICATION IN THE RESERVOIR CHARACTERIZATION PROCESS

Estimation of Petrophysical Logs

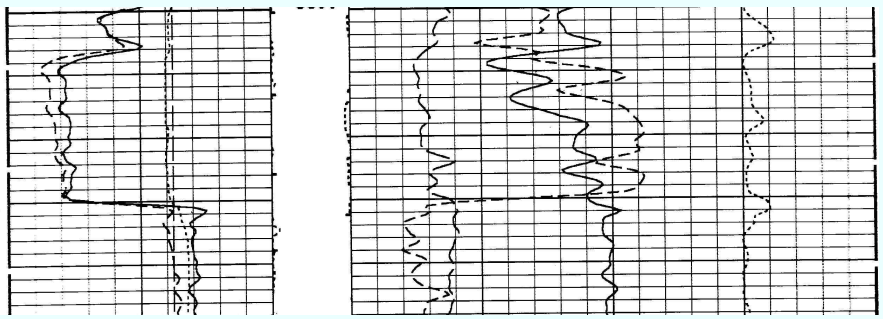
Estimation of Facies , Seismic Attributes

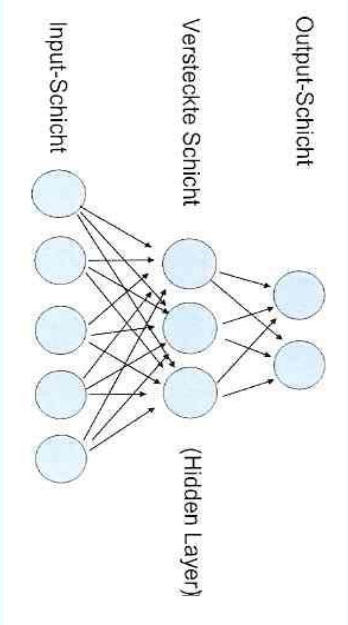
Exercises of real Logs, Facies and Attributes estimation using MatLab

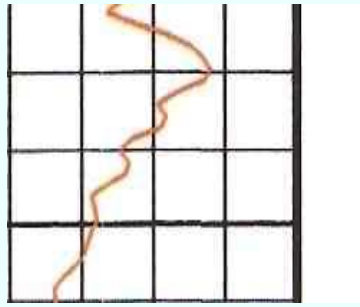


Hopfield Networks and Simulated Annealing: The Minimum Energy Status

Bayesian Networks







Registration Details

Payment and Registration

Tuition fees are due and payable in Euro upon enrollment in the course by bank transfer to the bank account given below unless another payment form is agreed

Unless otherwise indicated, the payment should be received before the date specified in the invoice as payment term to make the enrollment effective.

To register to the course please fill in the registration form and fax or email it along with the confirmation of your bank transfer to:

GeoNeurale
Lichtenbergstrasse 8
85748 Munich-Garching
T +49 89 5484 1
T +49 89 8969 1118
F +49 89 8969 1117

ONLINE REGISTRATION: www.GeoNeurale.com

Bank Information: Genossenschaftsbank EG Muenchen
Bank Account N. 519618 BIC – Code : GENODEF 1M07
BLZ 701 694 64 IBAN : DE19 7016 9464 0000 5196 18

Please indicate your name and the purpose: “Neural Networks course fee".

Provisions

Tuition fees are due and payable in Euro upon enrollment in the course. Unless otherwise indicated, fees do not include travel costs and living expenses of the participant.

Payments are also accepted via personal or company check, traveler's check, credit card, and Company Purchase Orders.

Cancellations by Participant:

All cancellation are subject to a 100 Euro non-refundable cancellation fee. Cancellation have to be notified to our office, at least 30 days prior to the course start date to receive a refund (less the 100 Euro cancellation fee).

If the participants are unable to cancel prior to the 32 days notification date, they may substitute another person at their place in a course by notifying us prior to the course start date.

Course Cancellations:

GeoNeurale reserves the right to cancel the courses if necessary. The decision to cancel a course is made at least two weeks prior to the course start date. If a course is cancelled, the participant will receive a full reimbursement of the tuition fees (but not of the plane ticket or hotel expenses or any other costs), or will be enrolled in another course upon his decision (the cost of the original course will be applied to the cost of the replacement course).

Before booking any flight or hotel, please wait the written course confirmation on our website. GeoNeurale can not be responsible for any penalties incurred for cancellation or change of flights or hotel reservations .

Refunds:

GeoNeurale will promptly remit all refunds of tuition fees due to cancellations or annullment (less any appropriate non-refundable cancellation fee) within 30 days of the course cancellation.

Force Majeure:

GeoNeurale can not be responsible for cancellations due to “force majeure” events : airplane or airport strikes, emergency situations, natural catastrophes and all situations and incidents independent or outside the human control that can delay or cancel the course. In case of such events related cancellations the course tuition fees will be refunded to the client .

GeoNeurale is not responsible for any delay or absence caused by the training instructor or training instructor company for reasons which are independent or out of the control of GeoNeurale´s decisions.

AGREEMENT: Upon enrollment all parts accept the above mentioned provisions. The above specified provisions shall regulate the agreement between GeoNeurale and the participant and the participant company and will enter into force upon enrollment.

REGISTRATION FORM

Please fill out this form and Fax to +49 89 8969 1117

or Email to Courses@GeoNeurale.com

The Logic of Neural Networks for the Petrophysical, Seismic and Facies Estimation

Munich

Course Date:

Name:

Company:

Address:

Job Title:

Phone:

Fax:

Email:

SIGNATURE: _____

INFORMATIONS, HOTELS, MAPS, LINKS

TRAINING LOCATION – RESEARCH CENTER

http://www.geoneurale.com/documents/GATE-Y7.pdf

GATE GARCHING

http://www.geoneurale.com/documents/GATE-Y6.pdf

MAP MUNICH-GARCHING

http://www.muenchen.city-map.de/city/db/130208000001/14269/Garching.html

MUNICH INFO and MAP MUNICH CENTRAL

http://www.muenchen.de/home/60093/Homepage.html

MAP MUNICH UNDERGROUND

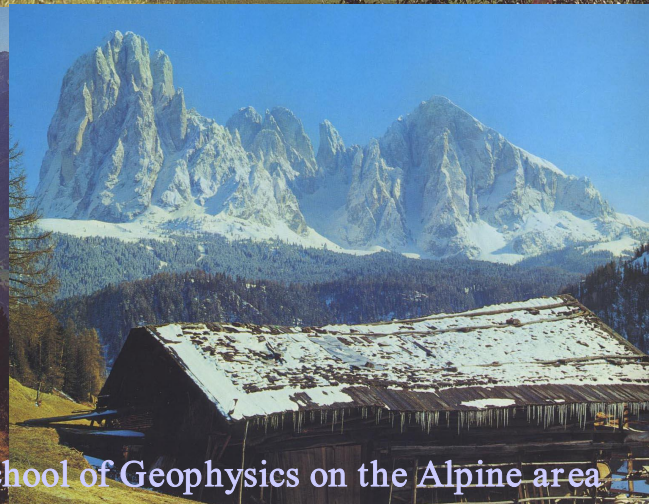
http://www.mvv-muenchen.de/web4archiv/objects/download/3/netz1207englisch.pdf

HOTELS NEAR GeoNeurale

http://www.geoneurale.com/documents/HOTELS-GARCHING.pdf

BAVARIA INFO

http://www.geoneurale.com/documents/Around-Munich-Info.pdf



A school of Geophysics on the Alpine area