



Pretopologies for Pattern Recognition, Data Integrity Checks, Ref. Integrity, and div. other Apps.

NWDKS 2001

March 31 - April 1, 2001

Hagen, Germany

for my father
 „Coppi“ Brandt
*1921 †2001



In this talk we will give an overview where pattern recognition currently is applied for. Mostly engineers apply “fuzzy methods” and/or other “modern things”. In particular if self learning or training is required -in particular if no further investigation w.r.t. “what physics is behind?”- the models are combined with neural networks.

We will demonstrate that pretopologies (= non-idempotent hull operators) or applying a given, well defined topology stepwise, could be more efficient with respect to less computing time, and also to less memory and program code, i.e. optimal for constructing small “intelligent” machines.

Concrete applications, key words and phrases (math. & comp. sciences):

pattern recognition, data chasing, referential integrity, data integrity, time series;

artificial (i.e. computer aided) smelling, hearing, visualising;

existing applications in other disciplines:

- medicine/dental: ECG, tartar; animal farming (*lit.: Boussejot, Kreiseler; Könnecke, Strackeljan; Jahns*)
- mechanical engineering: manufacturing and quality checks (*lit.: Könnecke, Strackeljan; Stolpmann*)
- chemistry and energy industry: errors/missings in process data, metering data, inconsistencies in forecasts, and other (*lit.: Peissig, Zamow, rdb*)
- climate research & weather forecast, reinsurance (derivatives): wind chill, further methods ...
(*lit.: Bauer, Müller, RDB, e.a.*)





agenda

- **N**atural methods: TOP and PreTOP vs Fuzzy for pattern recognition
- **D**ata chasing
 - referential integrity, data integrity, ...
- **K**itchen for
 - smelling, hearing, time series, ...
- **S**eriously Apps
 - ECG, tooth stone, animal farming, mechanical engineering: manufacturing and quality checks, errors in process data, metering data, ...



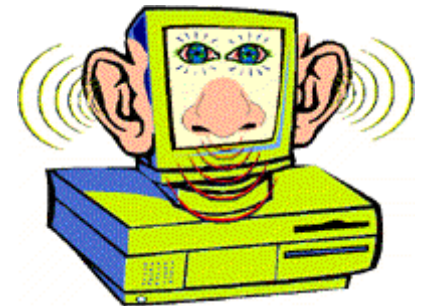


Human Interface Supervision System

Seeing



- External influences due to unauthorised persons/ fire/storm damage
- Formation of ice on parts of plants (leaks)
- Accumulations of liquids



Smelling



- Detection of small leaks
- Detection of the key substances benzene and hydrogen sulphide
- Separation of plant-specific smells from external smells (e.g. sour gas/liquid manure)

Hearing



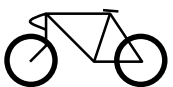
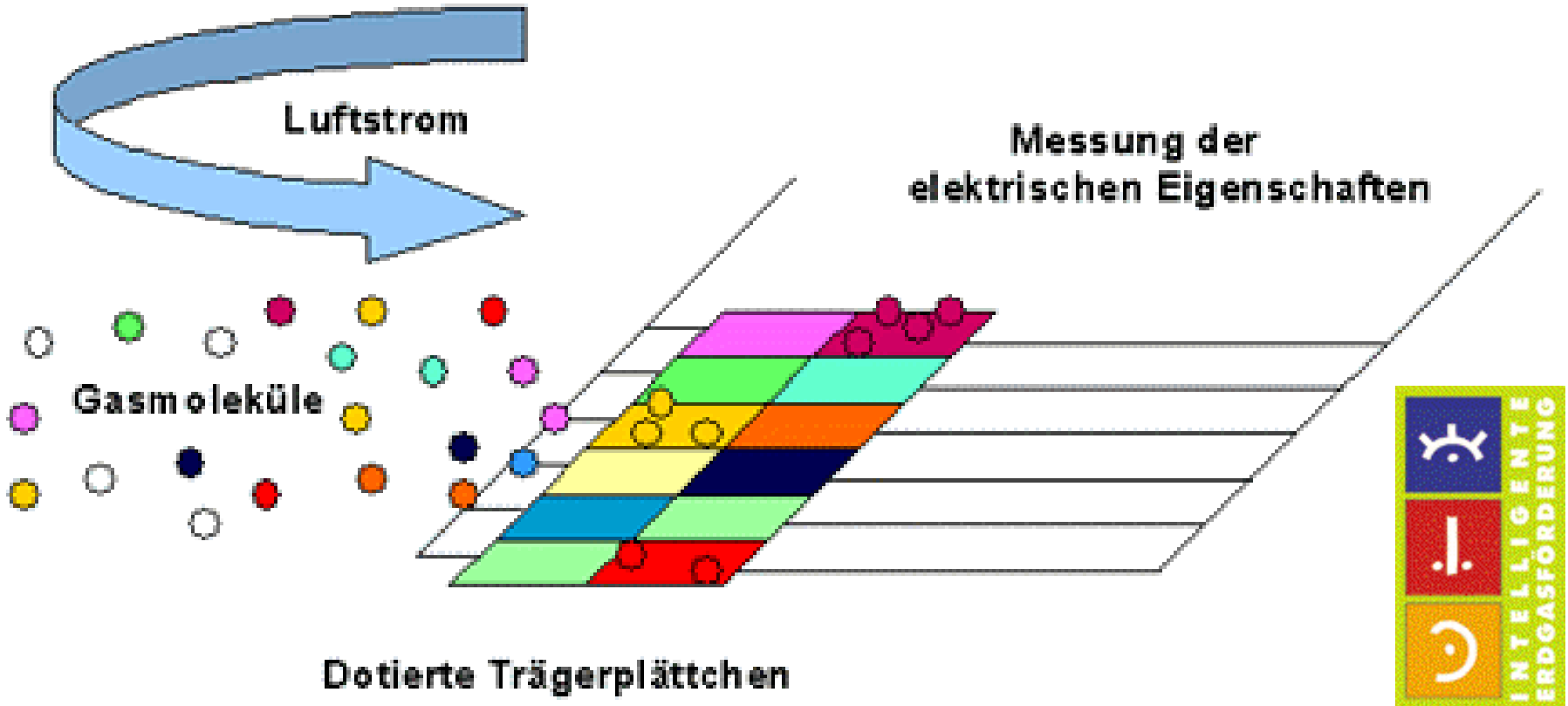
- Detection of small leaks (emissions of gases)
- Detection of faults (e.g. damage to pumps, bearings, etc.)
- Detection of malfunctions from the prevailing ambient noises





PreTop for pattern recognition ...

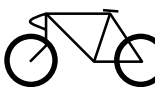
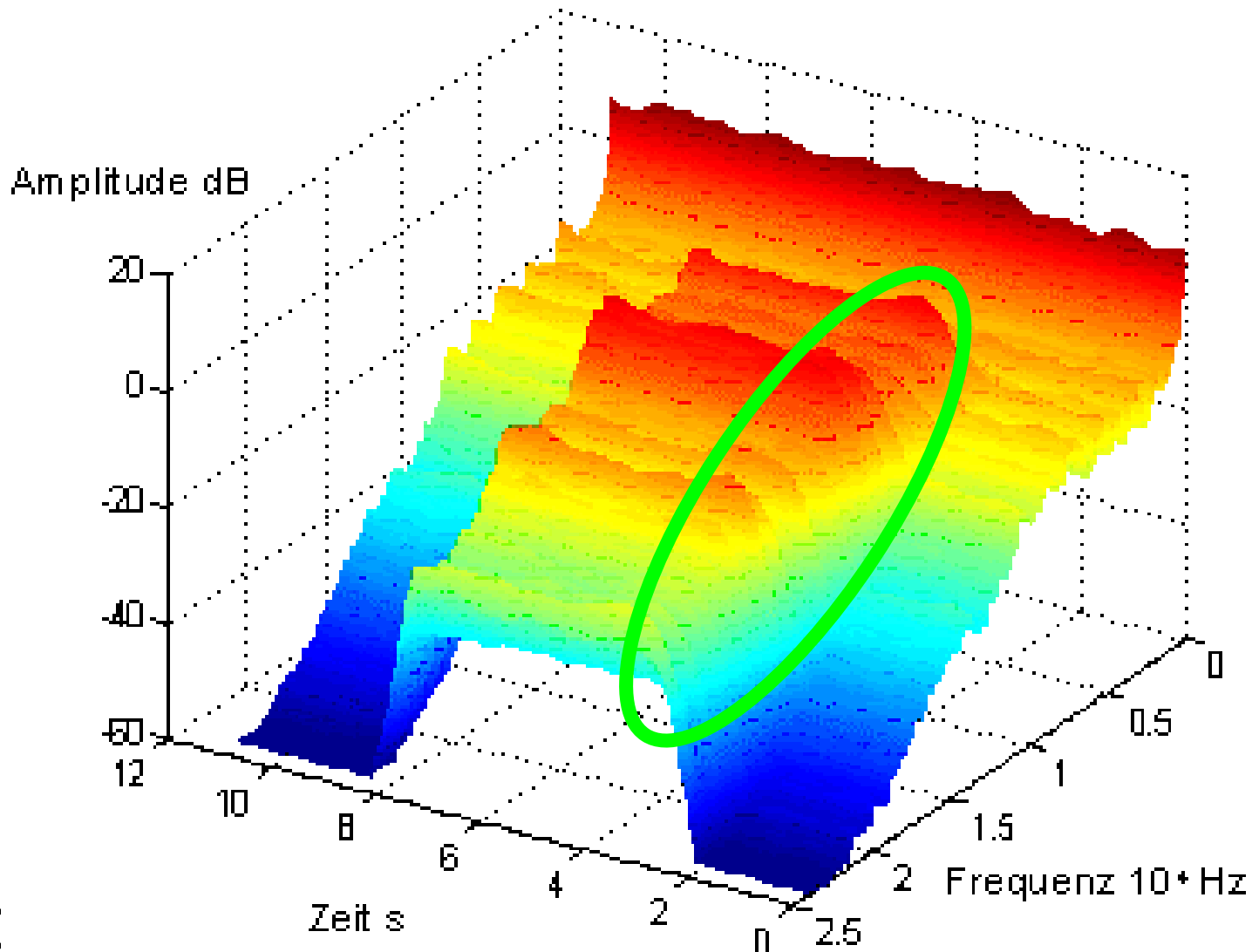
HISS





HISS

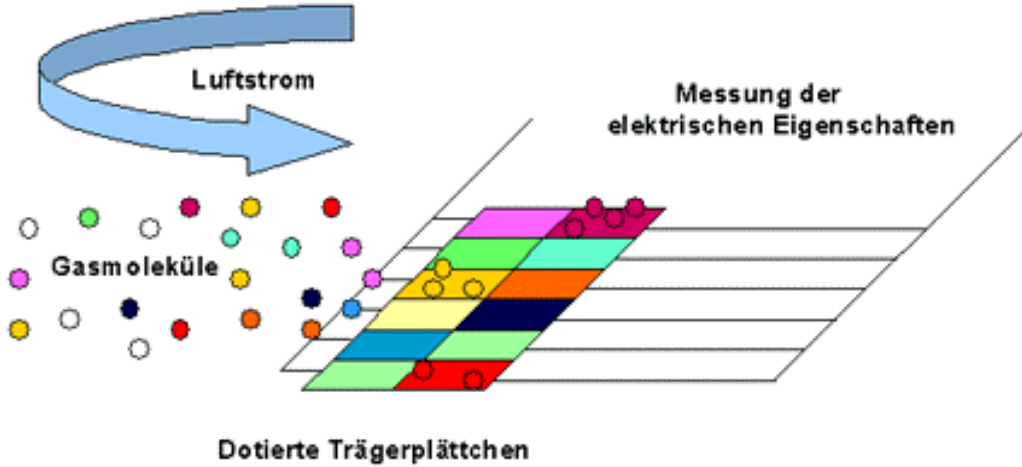
Ausströmgeräusch (5Nm³/h) mit Grundgeräusch





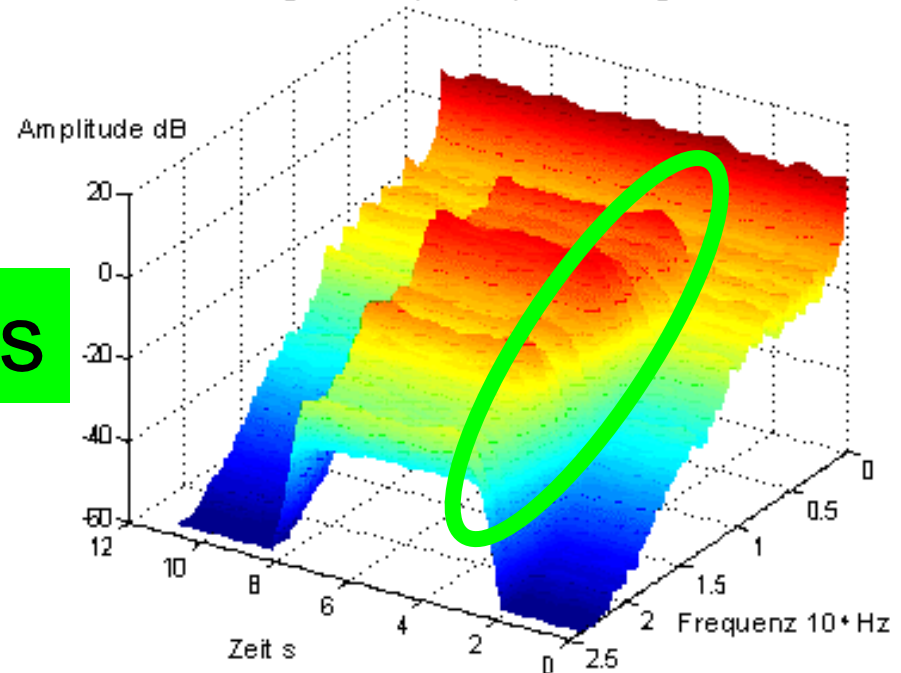
PreTop for pattern recognition ...

HISS



**pattern recognition:
fuzzy logic & neural nets
better => PreTOPs**

Ausströmgeräusch (5Nm³/h) mit Grundgeräusch



<http://www.beb.de/hiss>



Intelligente Erdgasförderung

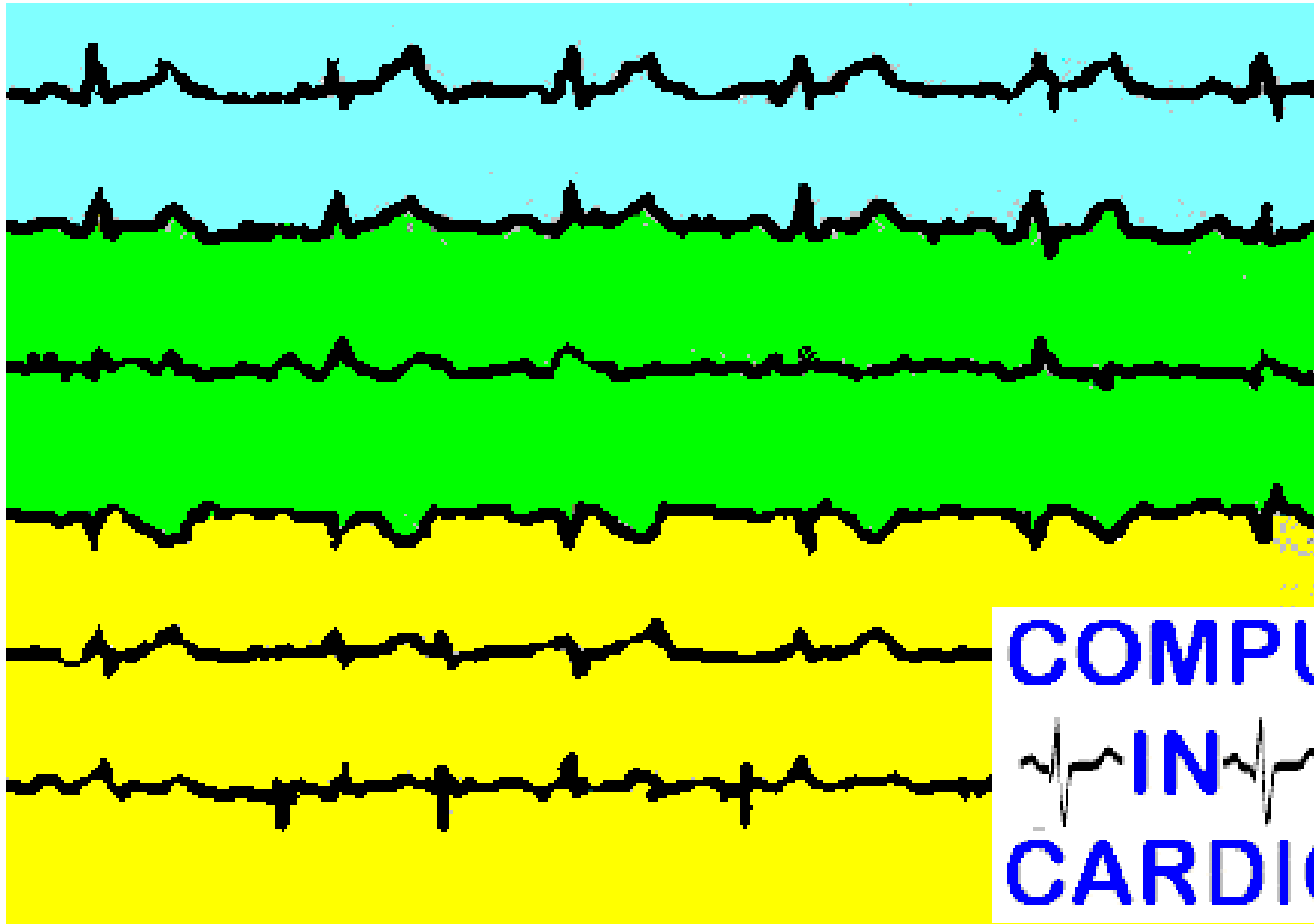
EXPO2000 HANNOVER


Registriertes Projekt der Weltausstellung





ECGs



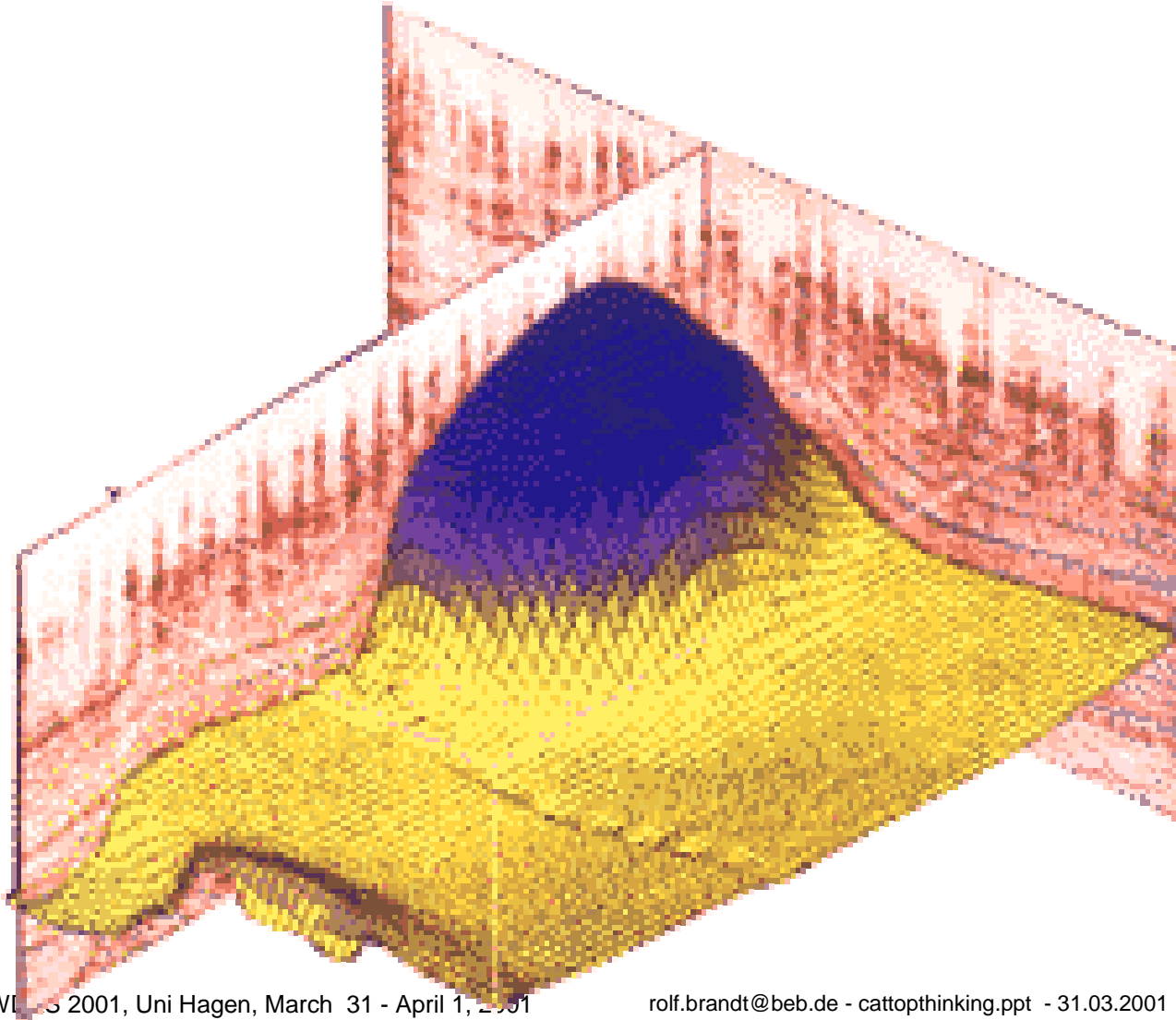
**COMPUTERS
IN
CARDIOLOGY** 





PreTop for pattern recognition ...

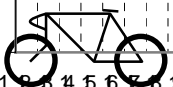
number crunching ...





PreTop for pattern recognition ...

errors in time series



NWDKS 2001, Uni Hagen, March 31 - April 1, 2001

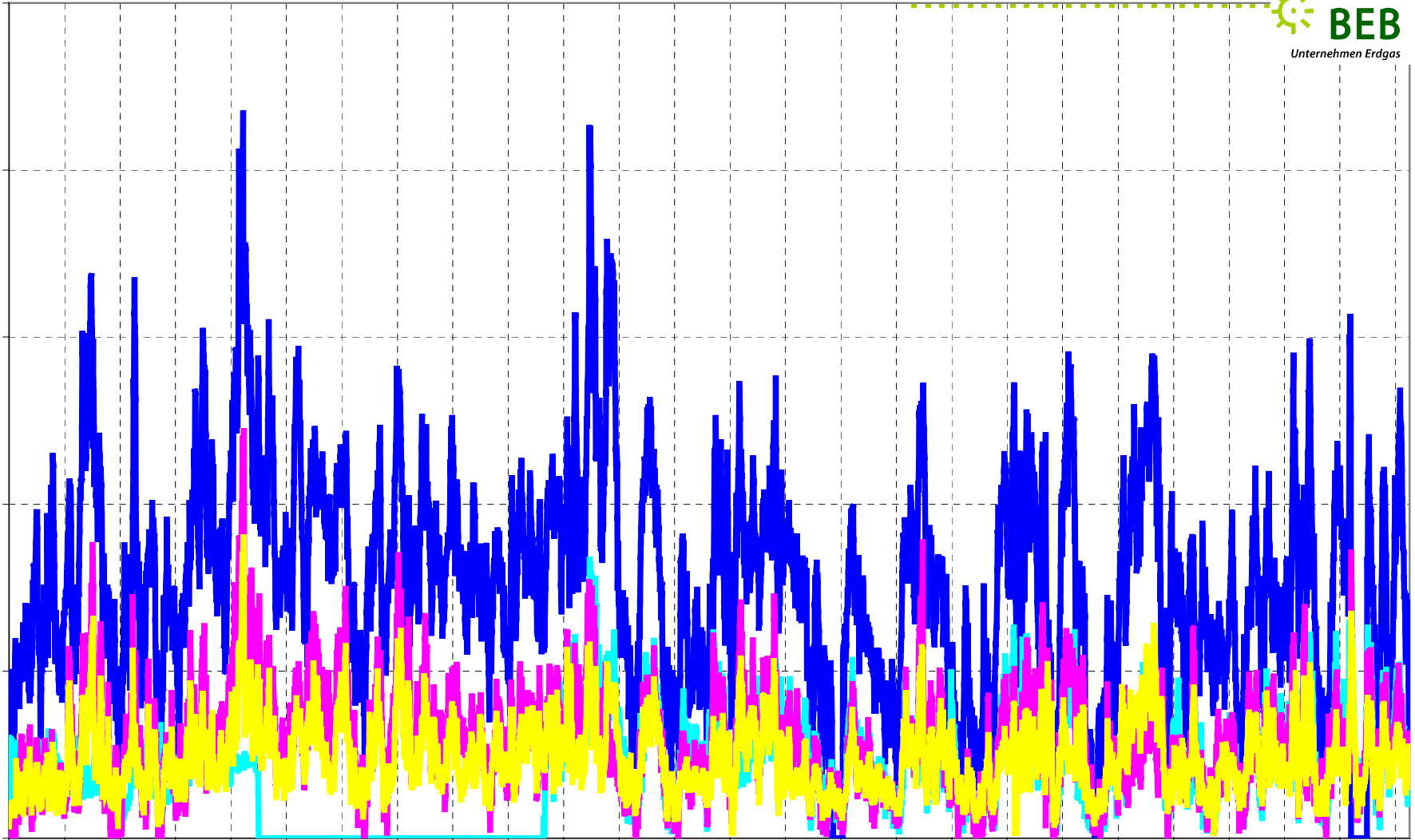
rolf.brandt@beb.de - cattothinking.ppt - 31.03.2001





PreTop for pattern recognition ...

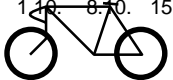
errors in time series



1.10. 8.10. 15.10. 22.10. 29.10. 5.11. 12.11. 19.11. 26.11. 3.12. 10.12. 17.12. 24.12. 31.12. 7.1. 14.1. 21.1. 28.1. 4.2. 11.2. 18.2. 25.2. 4.3. 11.3. 18.3. 25.3.

NWDKS 2001, Uni Hagen, March 31 - April 1, 2001

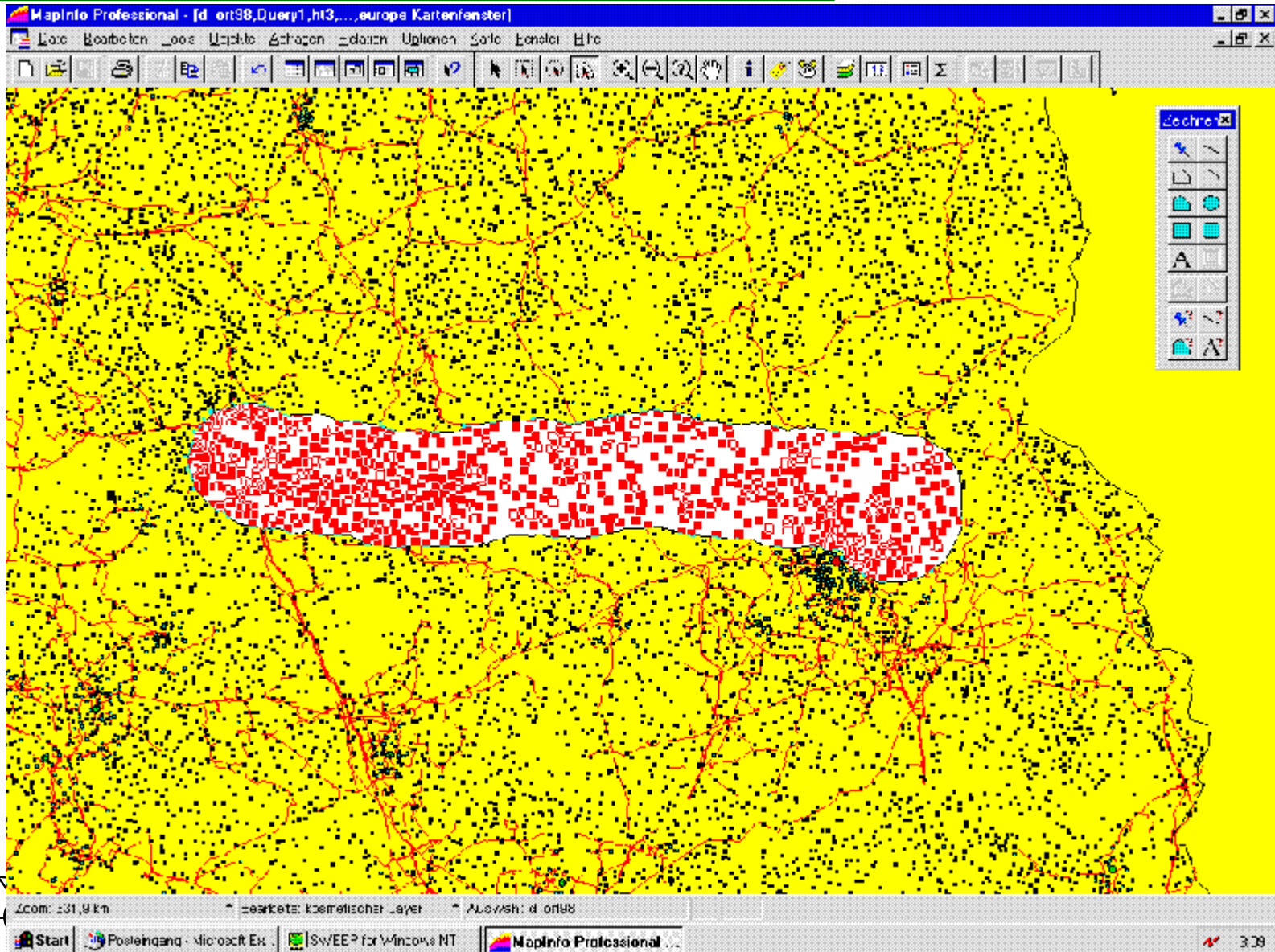
rolf.brandt@beb.de - cattopthinkii letzte Ist-Datum/h: 26.03.2001 18-19h





PreTop for pattern recognition ...

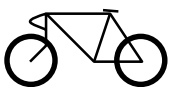
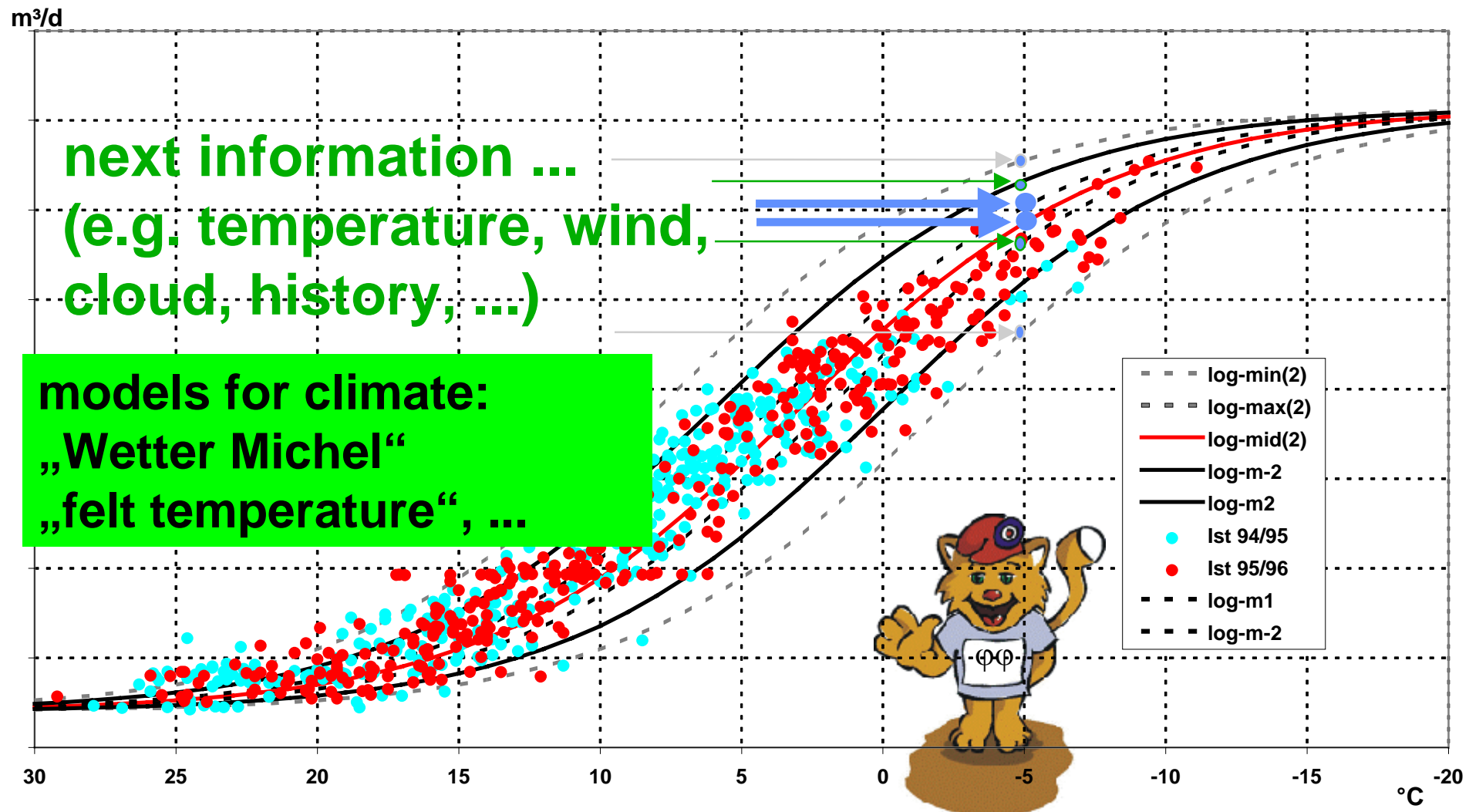
visualisation GIS (geo info sys's)





PreTop for pattern recognition ...

forecasting energy over temperature



... thank you
for your
kind
attention ...

