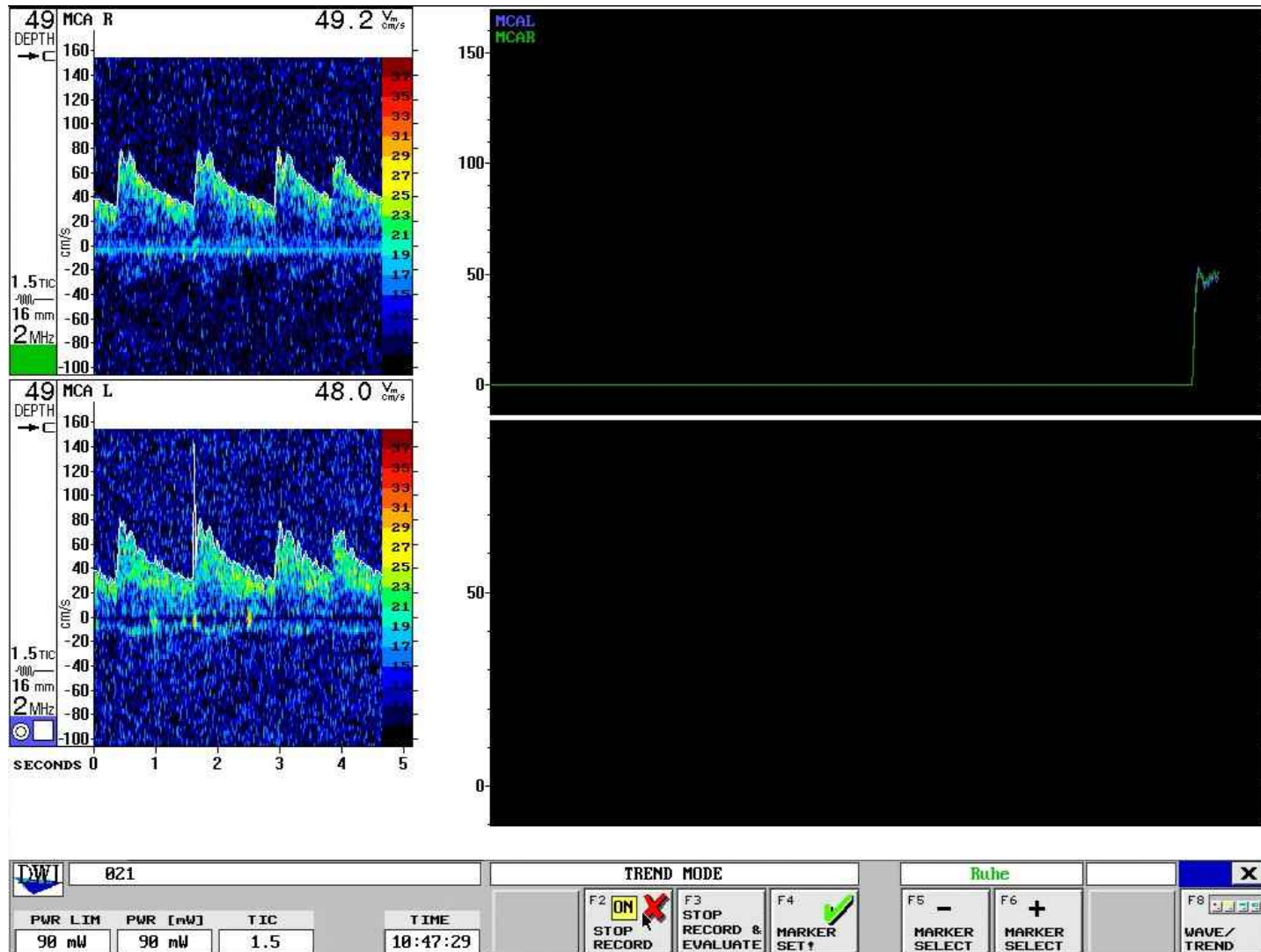


Herbert Breunung

medizinische
Bildverarbeitung
mit Perl 5

Ultraschallsonar



Ultraschall-Sonden

„Hallesche Halterung“



An der MCA

„Hallesche Halterung“

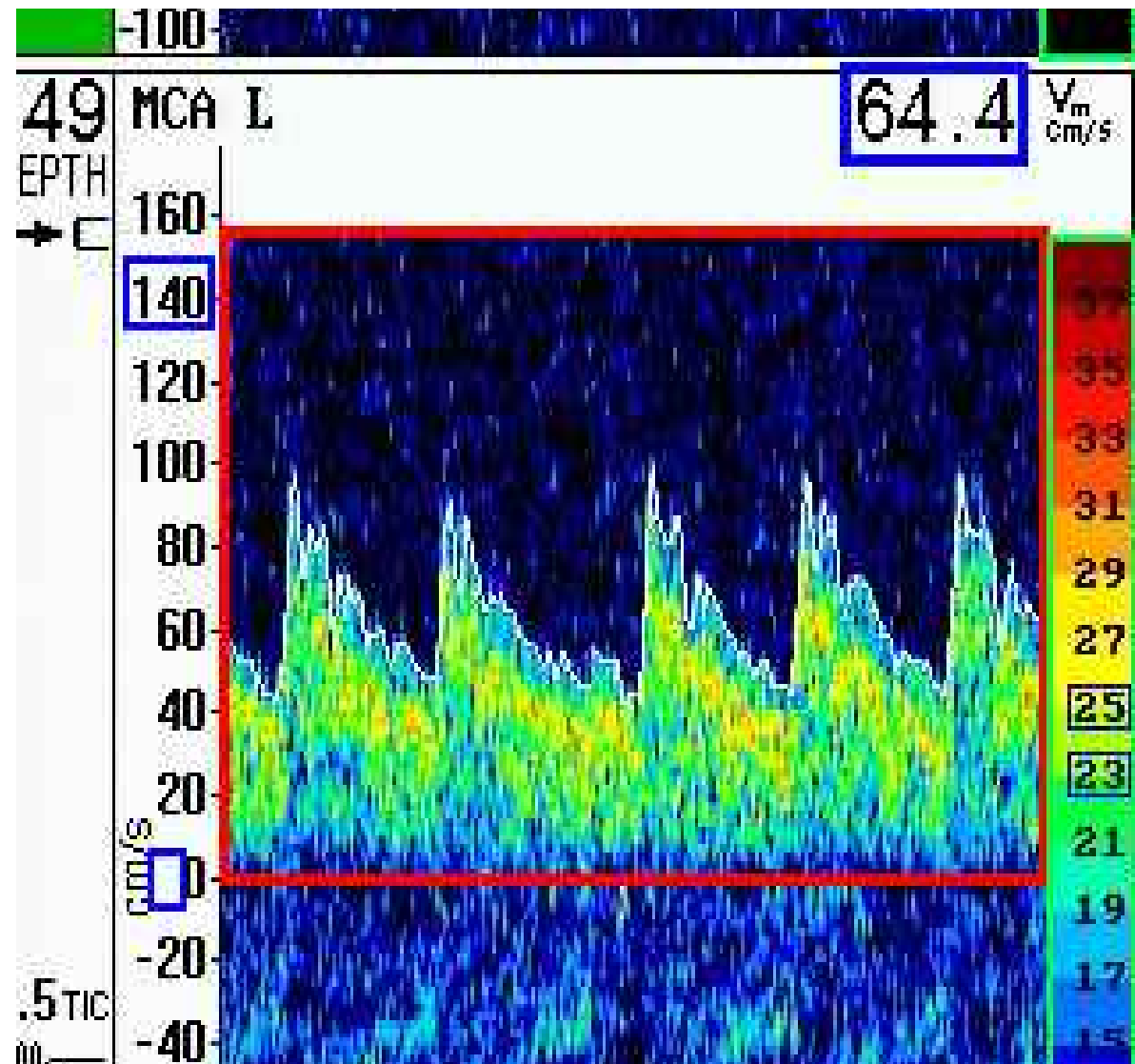


middle cerebral artery

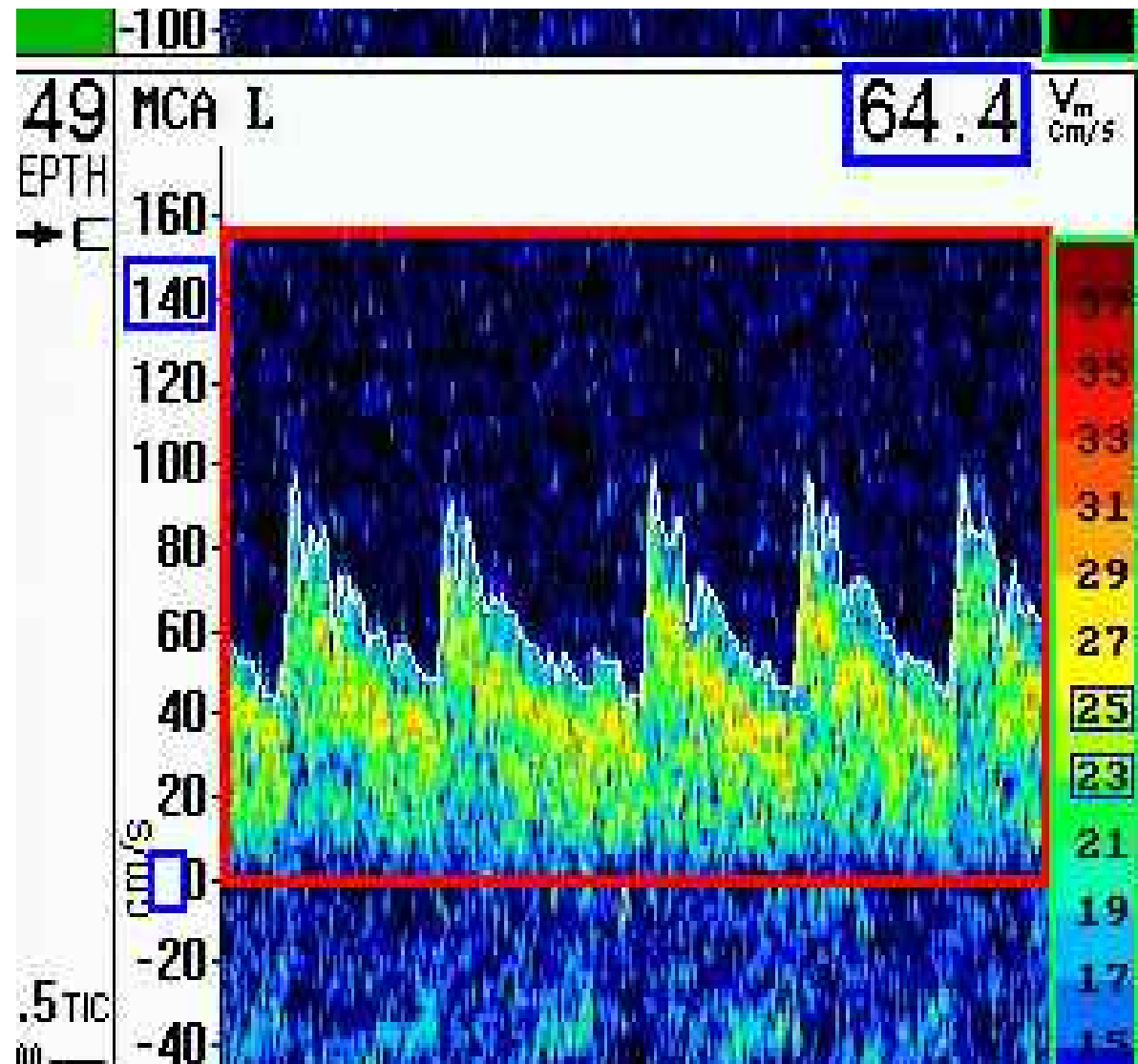
„Hallesche Halterung“



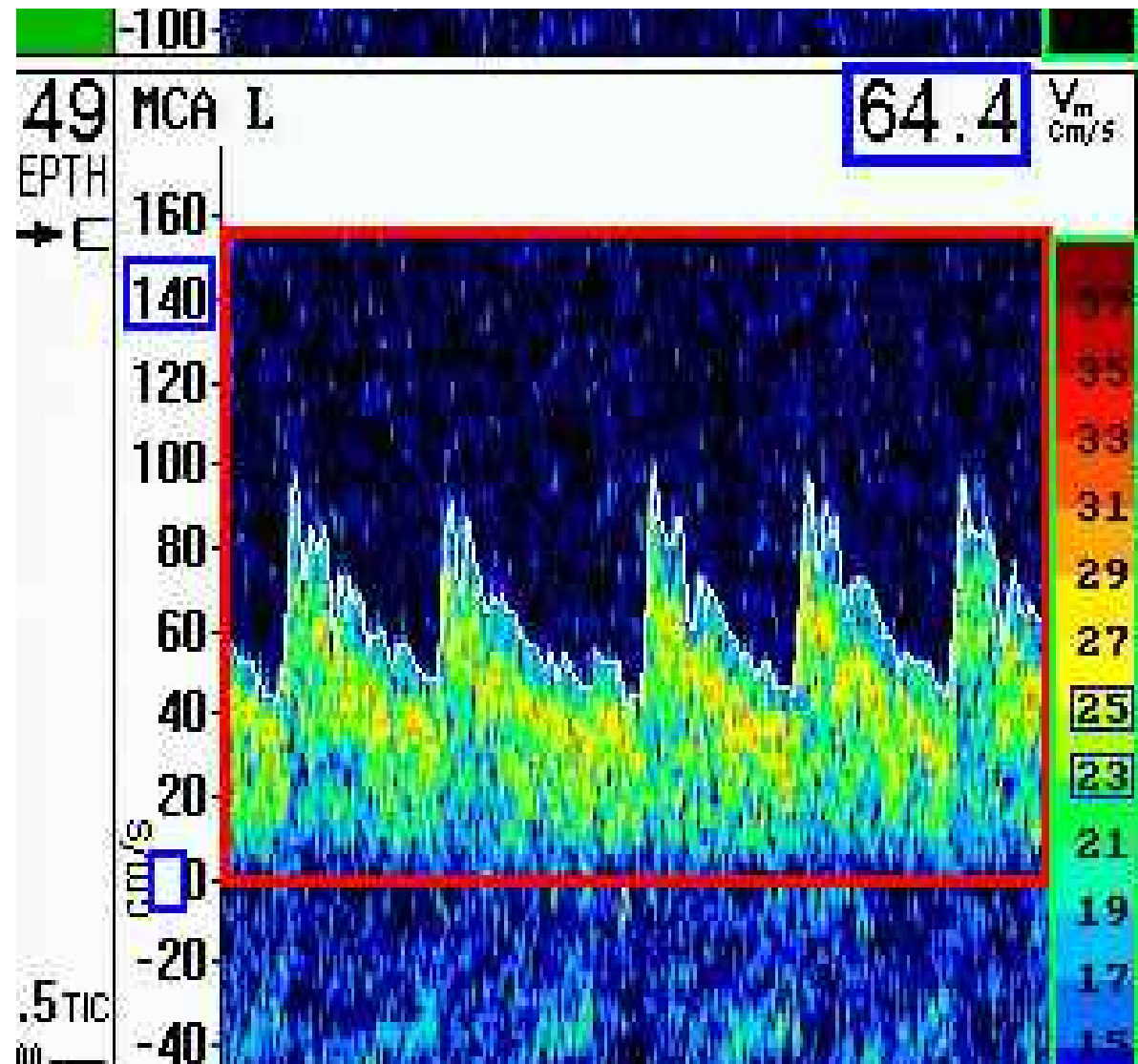
X – Zeit t



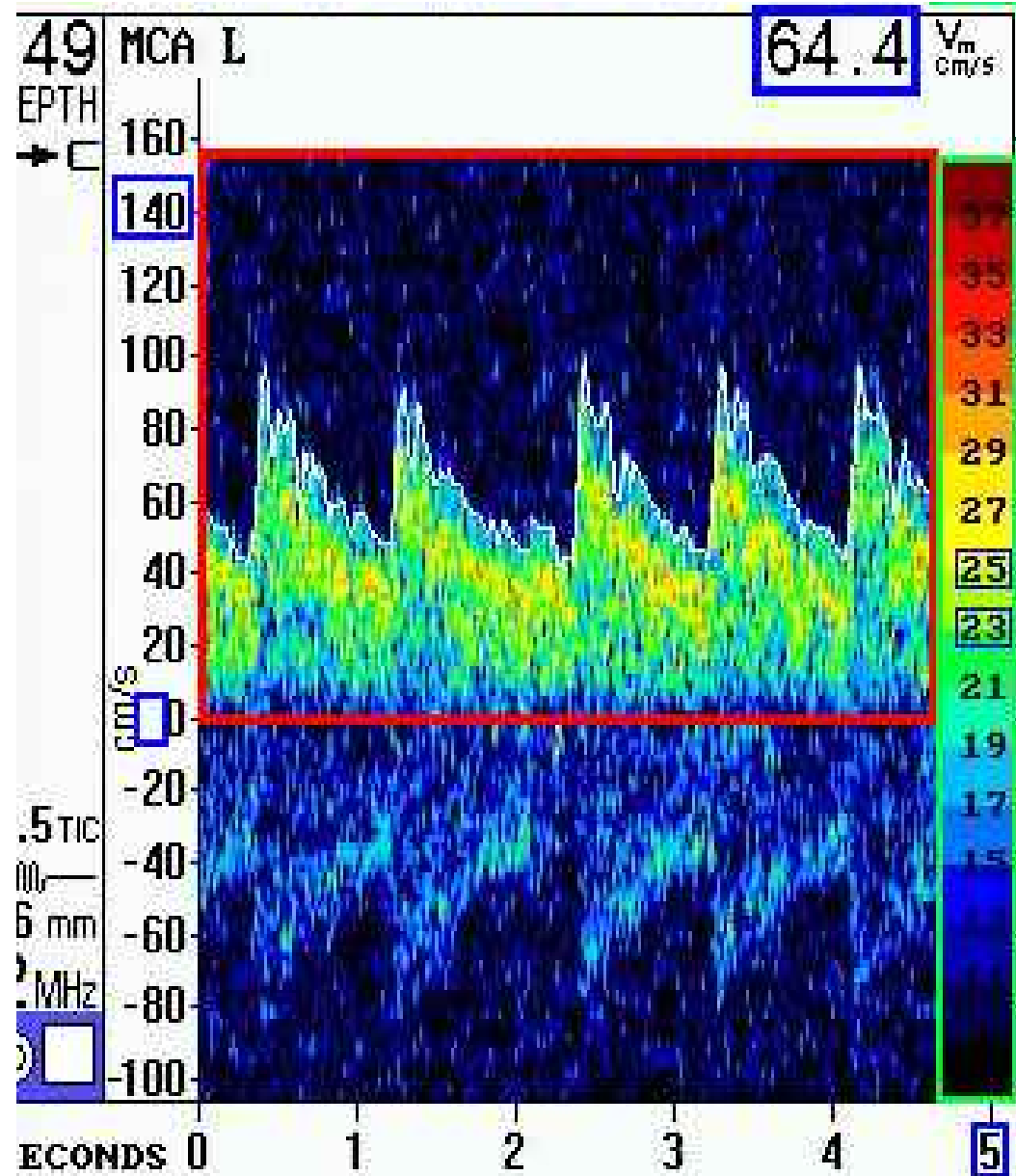
Y – Blutfluss v



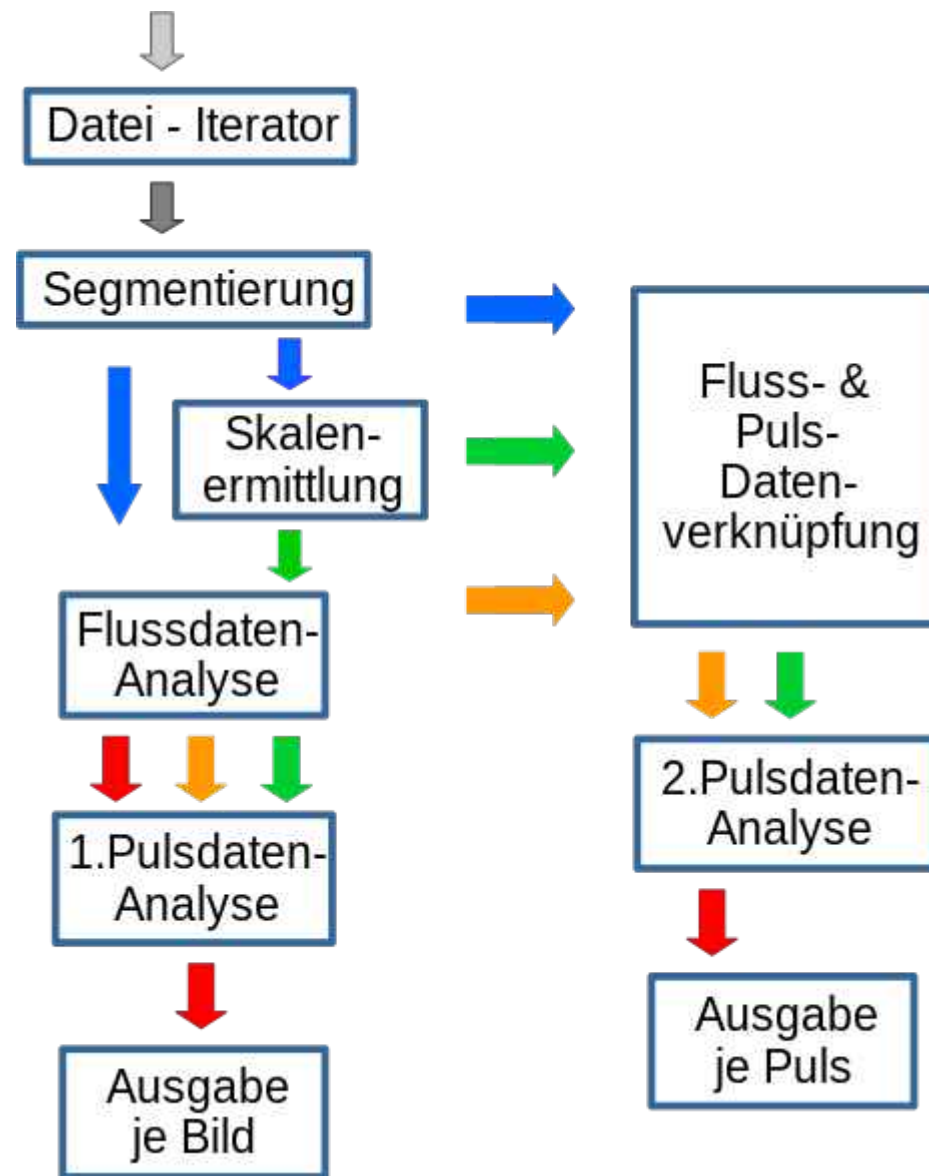
Farbe – n Teilchen



regions of interest



data flow



Benutzen Module:

**Image::Magick,
YAML, Text::CSV**

Nicholas Clark,
Gummersbach 2018

How Geizhals took
out ImageMagick
before ImageMagick
took **us** out.

Benutzen Module:

GD, **YAML**
Text::CSV

Daten

80+ studien ~ 4 GB

Daten

80+ studien ~ 4 GB

...und der Spaß beginnt

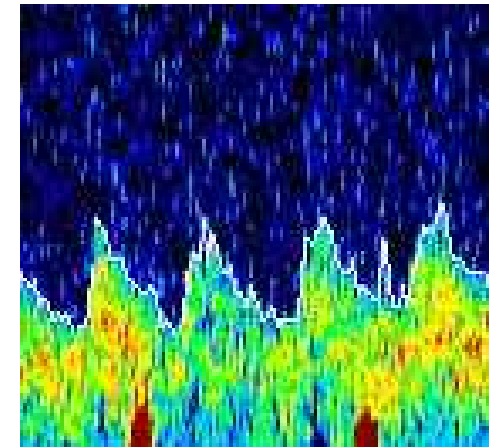
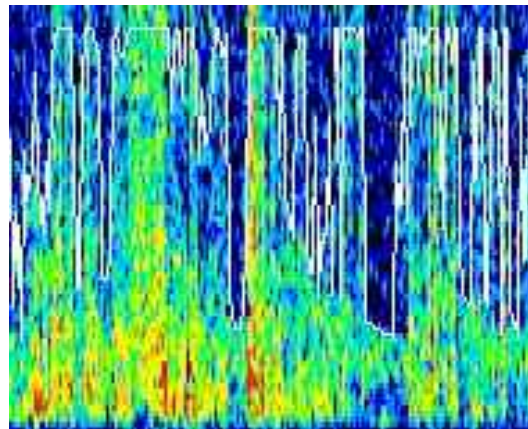
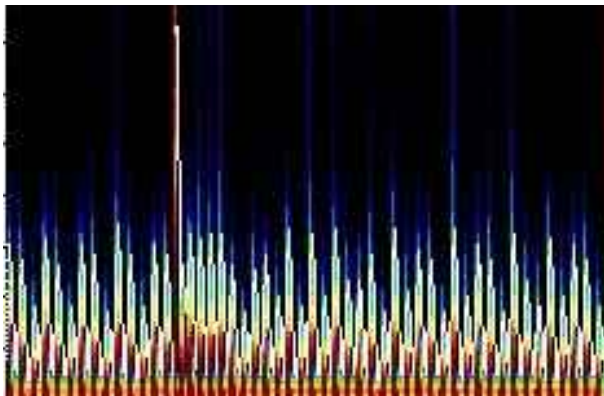
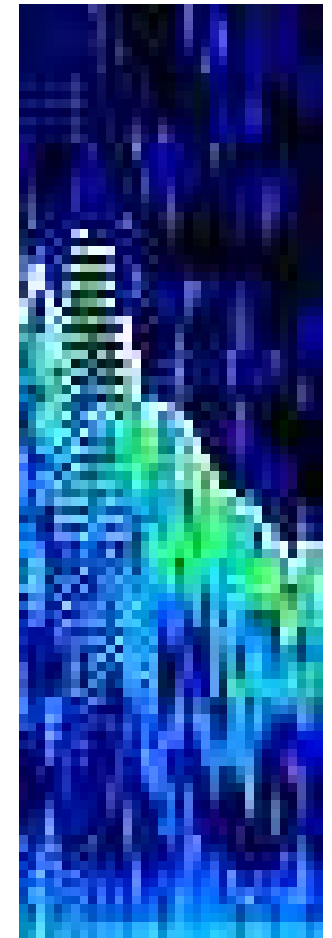
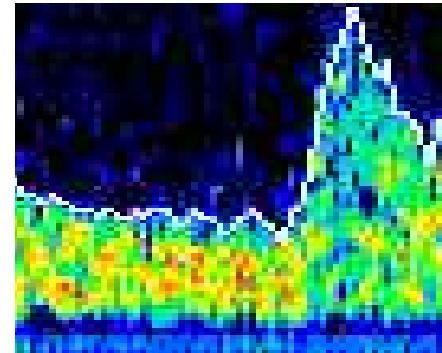
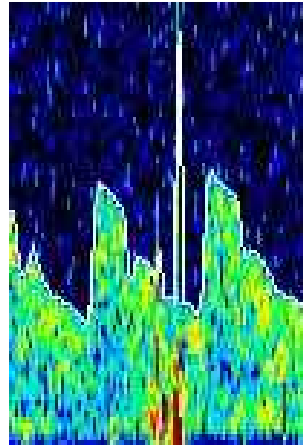
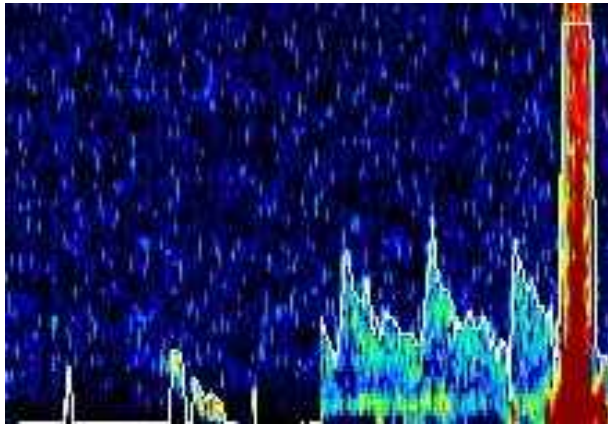
login screen



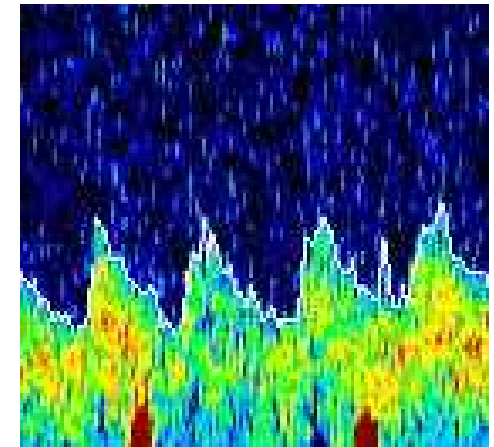
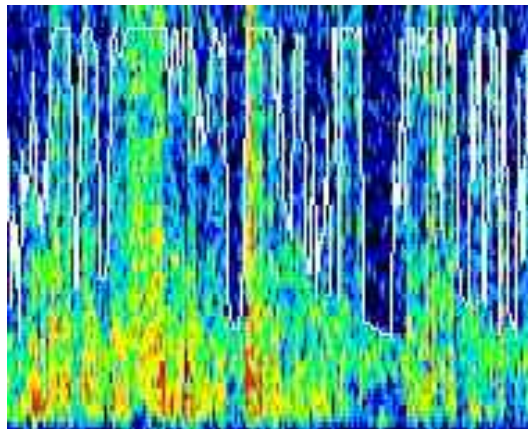
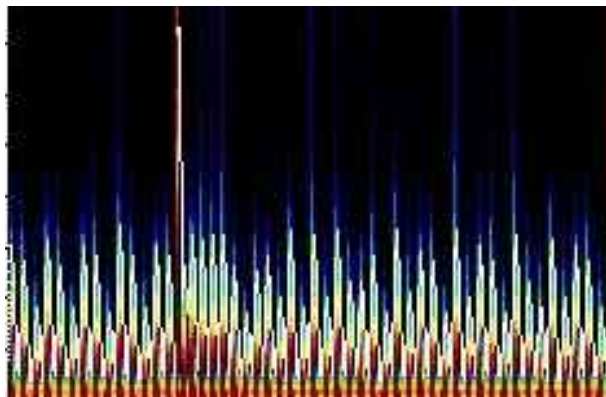
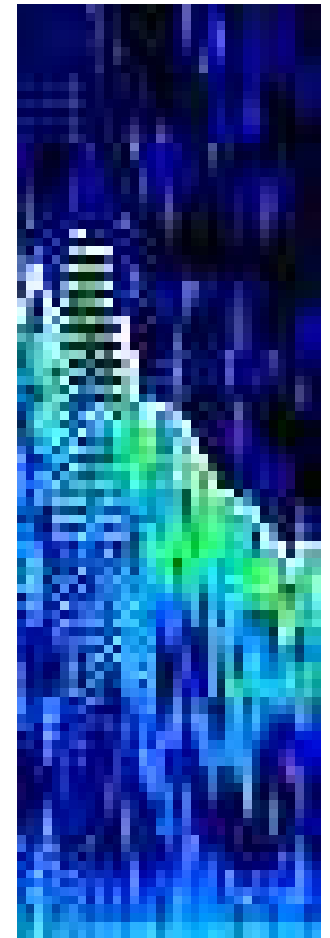
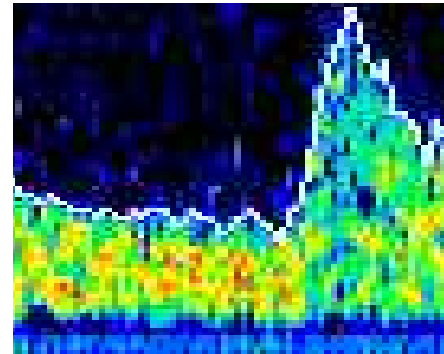
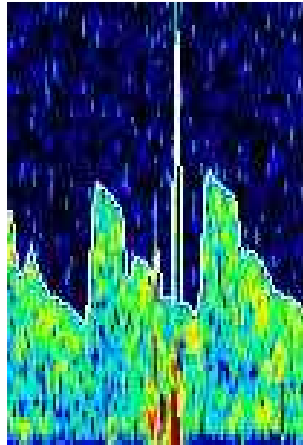
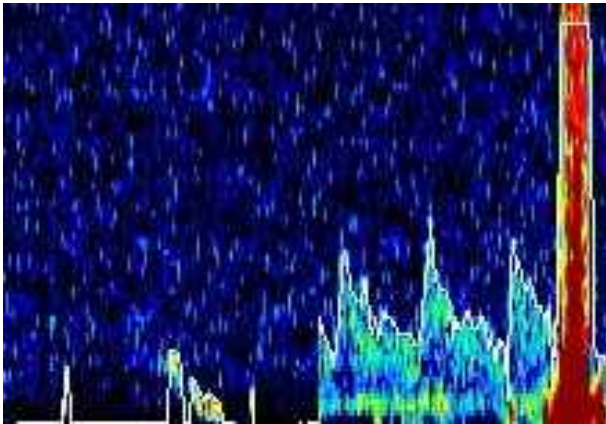
Probleme:

schlechte Auflösung,
hohe JPG **Kompression**,
Artefakte der Bildaktualisierung,
Spitzen in der Pulskurve,
Arterienvibration, Gerätefehler,
fehladjustierte Sonden

Bildartefakte



finde Heuristiken



finde Heuristiken

Was lernte ich?

Lektion 1

Qualität > Geschw.

Lektion 1

Qualität > Geschw.

Qualität == Geschw.

Lektion 1

wiederholte Tests
problematischer Teilmengen

(AI - boosting)

Lektion 1

wdrh. Tests probl. Teilmengen

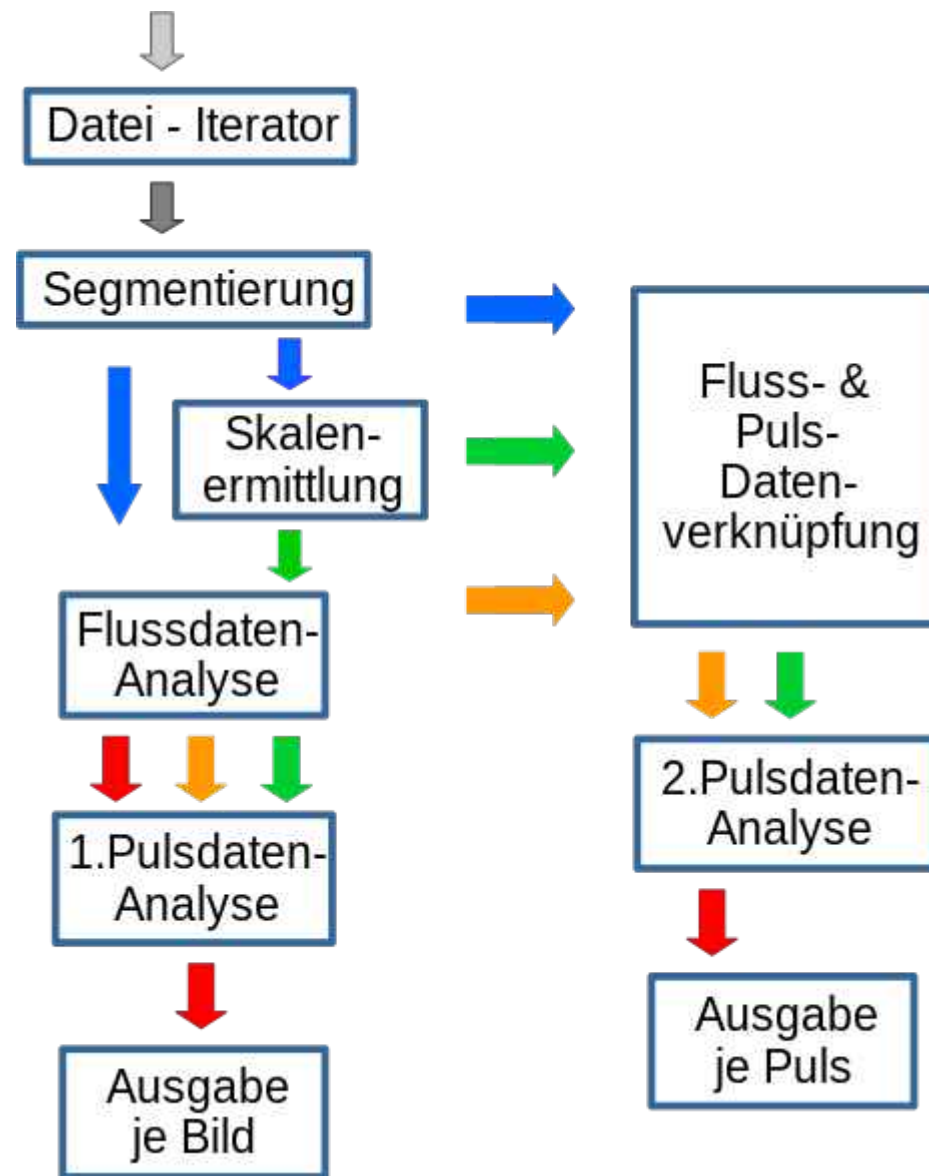
Regression on 3.5GB (10h)

Lektion 2

Löse Probleme

linear ?

Datenfluss



Lektion 2

Benutze Wissen

Lektion 2

Benutze Wissen

Speed !!

Lektion 3

Niemand
tat das vor uns?

Lektion 4

brain freeze:
Arterien
erweitern sich?

Lektion 4

brain freeze:
langsamer aber
mehr Blut

Lektion 4

Reflex zum Schutz von Herz und Gehirn

Lektion 4

Reflex zum
Schutz von
Schlaganfall-
patienten?

Lektion 4

**Handelt
verantwortlich!**

FIN

Danke