

HELMHOLTZ AI LOCAL UNIT FOR MATTER AT HZDR

Peter Steinbach
(HZDR)

 psteinb  psteinb_

DESY, Dec 4, 2020

HELMHOLTZ AI RECAP

TWO FUNDING LINES

Helmholtz AI Projects



[unsplash.com:Glenn Carstens-Peters](https://unsplash.com/photos/8jKjKjKjKj)

Helmholtz AI Vouchers



[unsplash.com:Dominik Scythe](https://unsplash.com/photos/8jKjKjKjKj)

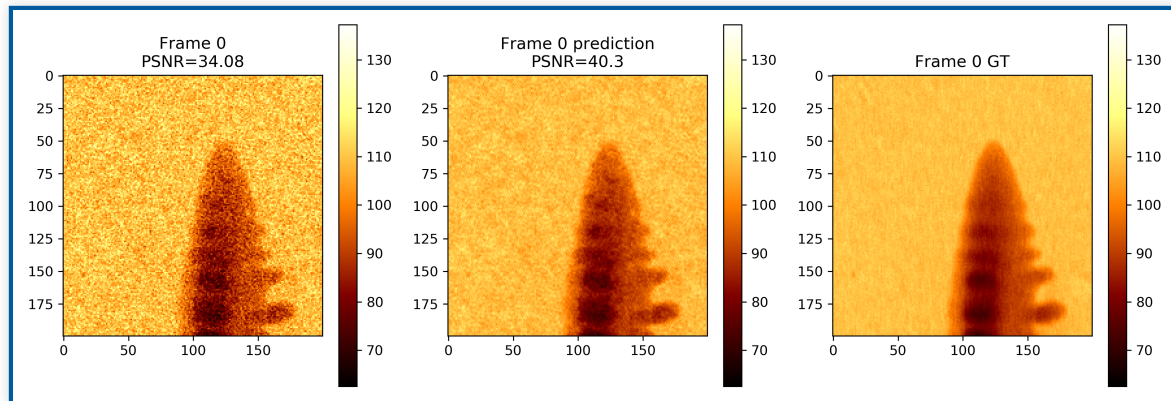
HELMHOLTZ AI AT HELMHOLTZ- ZENTRUM DRESDEN-ROSSENDORF

HELMHOLTZ AI CONSULTANT TEAM AT HZDR

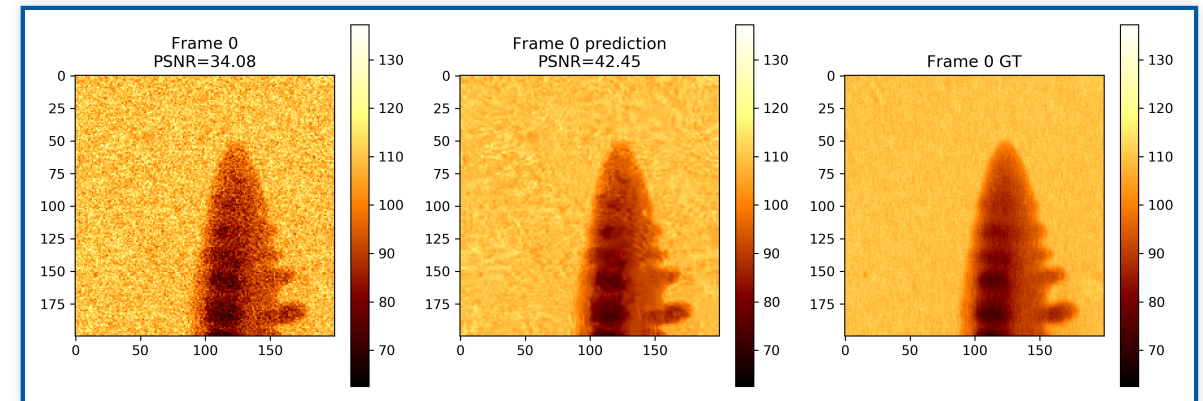


- reproducible automated pipelines
- (image) classification
- regression & pattern recognition (object localisation, image segmentation)
- inverse problems & generative modelling
- (image) denoising

EXAMPLE VOUCHER: NOT SO LIQUID METAL (HZDR)



PPN2V

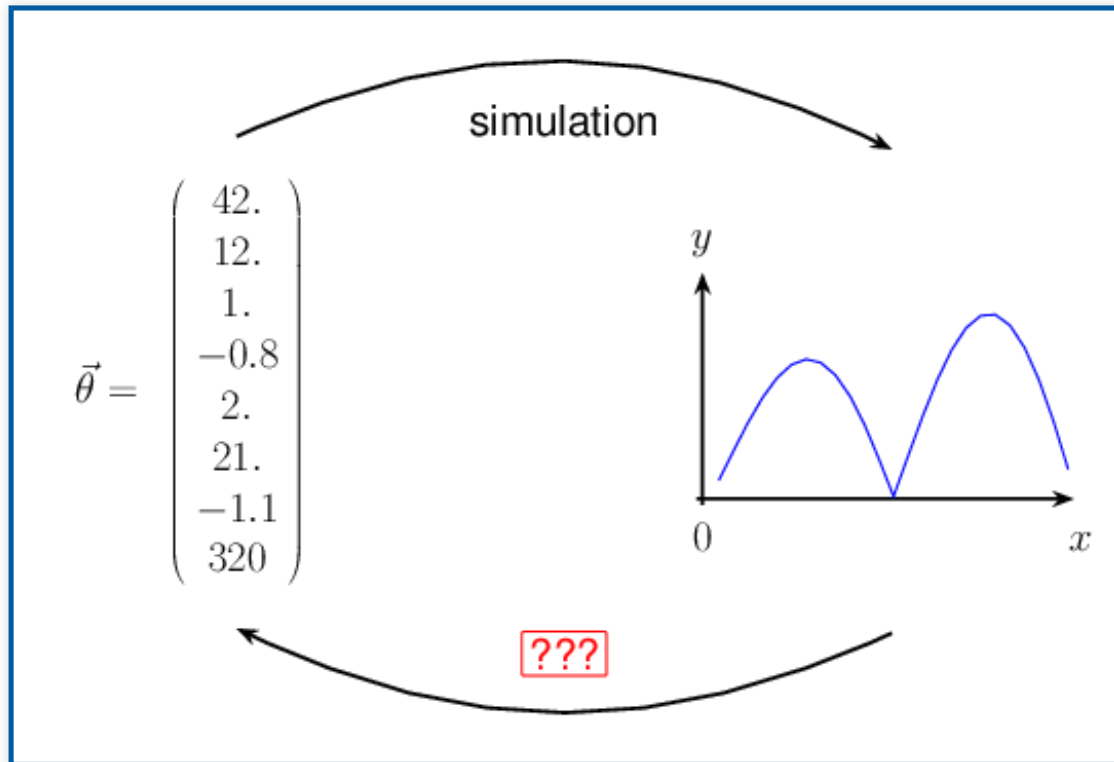


BM3D

Conclusions:

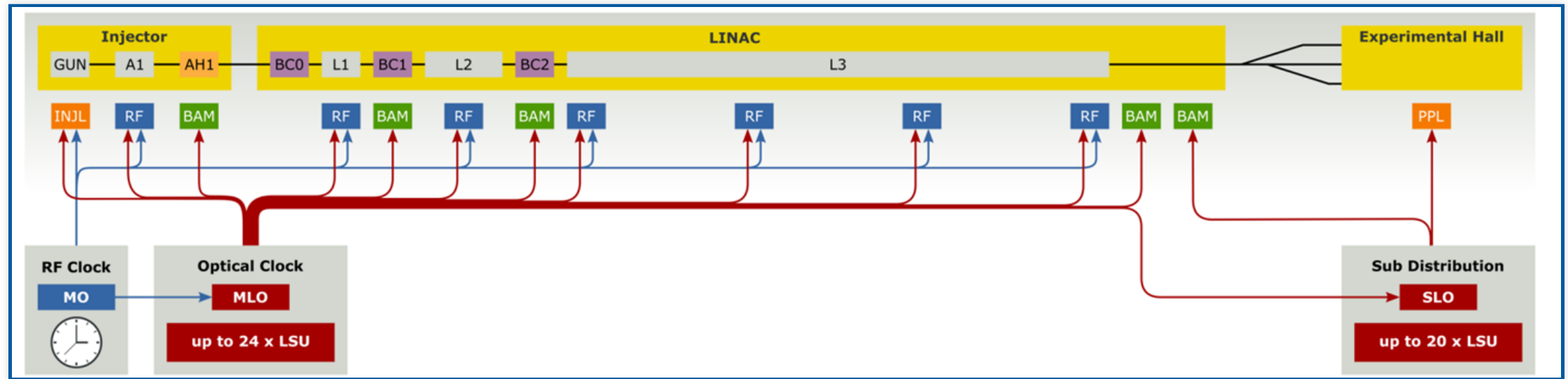
- BM3D denoiser very good denoising, but slow
- Deep Learning based denoising yields comparable quality, fast inference

EXAMPLE VOUCHER: INVERTING A BEAMLINE SIMULATION (HZG)



- application: beam profile of beamline parameters
- beam simulation of high precision available
- given experimental beam profile, what are the simulation parameters?

EXAMPLE VOUCHER: ANOMALY DETECTION (DESY HH)



- detect anomalies in accelerator monitoring data
- review methods with neural networks et al or clustering
- aim: Select architectures that are able to answer in at least 100 ms (or less)

SUMMARY

HELMHOLTZ AI @ HZDR

- Local Unit for Matter Unit at HZDR installed
- our team is ready for vouchers!
(currently occupied for the next 2 months)
- get in touch if you like to discuss an idea

*Thank you for your Attention!
Questions, Concerns, Feedback?*

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- annual call
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 - 2020 open: deadline Dec 1, 2020

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(2 weeks to 6 months FTE)

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- accepting pilot vouchers:
consultant-helmholtz.ai@hzdr.de

HELMHOLTZ AI LOCAL UNIT FOR MATTER AT HZDR



Nico Hoffmann, YIG Lead



Peter Steinbach, Consultant Lead