



# Hajo Nils Krabbenhöft

Fractional CTO / AI R&D / Performance Optimization

20+ years of shipping production systems that don't fall over. Companies hire me for the hard part: the architecture, the AI that won't converge, the bottleneck nobody could fix. I build the prototype or write the spec, then your team takes it from there. **You'd be surprised how much money a good plan saves down the line.**

## 01 WHAT I DO

### Fractional CTO

A few days a month of senior tech leadership without the €300k/year overhead.

### AI R&D

Novel models, failure diagnosis, and GPU-to-CPU conversion to slash deployment costs.

### Performance

3-day sprints to fix the bottleneck, reduce hardware usage, and deploy for cheap.

### Due Diligence

I read the code, not just the pitch deck. If there is execution risk on the tech side, I'll find it.

## 02 SIGNATURE WINS



### ImageRights - 0→1 CTO - we catch image thieves 10+ YRS IN PROD

Sole architect of the web crawling stack (**5,000+ concurrent crawler tasks** orchestrated with Ansible), the distributed C++ content-based image retrieval database that scales to **billions of web images**, all internal AI filters, and the workflow automation that turned image enforcement into a real product. Still running today.



### Spatial Audio Designer - 0→1 CTO - from idea to HOLLYWOOD

Real-time routing and panning of **500+ audio channels** on 2013 hardware. NEON & AVX-vectorized DSP, plugins for VST/RTAS/AU/AAX (Pro Tools was non-negotiable), plus virtual sound card kernel drivers for Mac and Windows. ARM version for embedded, smartphones, and VR headsets. Still in use today by famous Hollywood studios.



### Leading AI R&D - speech, vision, and reinforcement learning 3x #1

**Common Voice German:** 3.64% WER with the TEVR paper (June 2022). Whole inference engine fits in 284 lines of C++ and runs CPU-only, 100% private & GDPR compliant. **Sintel Clean EPE matched:** #1 with a custom optical flow AI (Sept 2020). **Coder One Bomberland:** #1 mid-season, #2 overall, with self-play RL squeezed down to CPU-only inference for tournament play. I prefer math over throwing GPUs at random ideas.

**recent MSFS2024 on Linux:** figured out how to make multi-camera and instrument pop-outs work in Proton 11. Required tracing the full stack from the game (inside Proton) through vkd3d, Proton, the host kernel, all the way down to the GPU driver.

► [hn@hajo.me](mailto:hn@hajo.me)

## 03 SELECTED EXPERIENCE

<b>CTO</b>	<b>ImageRights International</b> · Built and runs the tech stack that finds stolen images at internet scale.	2014 – now
<b>CEO</b>	<b>DeutscheKI GmbH</b> · German AI consultancy. On-premise speech recognition, GDPR-clean, no cloud lock-in.	2022 – now
<b>CTO</b>	<b>NEW AUDIO TECHNOLOGY GmbH</b> · Sole developer of the 3D Spatial Audio engine in its Hollywood breakthrough phase.	2014 – 2015
<b>FOUNDER</b>	<b>hajo</b> (independent) · Fractional CTO, AI R&D, and technical due diligence for EU and US clients.	2012 – now
<b>FOUNDER</b>	<b>spratpix GmbH &amp; Co. KG</b> · Image database and the AskBubo near-duplicate image search engine.	2009 – now

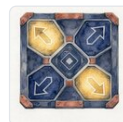
## 04 CURRENT INTERESTS & HOBBIES



Robotics



Electronics



PIU



CNC



Bicycling

### CONTACT

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**LOC** Kronshagen, DE  
Kiel / Hamburg area

### STACK

C++ Python CUDA PyTorch  
TensorFlow Linux NEON / AVX  
Kernel drivers PostgreSQL  
Docker Ansible Ruby on Rails  
VST / AU / AAX

### DOMAINS

- ▶ AI / ML research & productionizing
- ▶ Computer vision at scale
- ▶ Real-time audio & DSP
- ▶ Speech recognition
- ▶ Distributed systems
- ▶ Workflow automation
- ▶ Performance optimization
- ▶ Embedded & robotics

### EDUCATION

#### M.Sc. Mathematics in Medicine & Life Science

Universität zu Lübeck

2012 – 2014

#### B.Sc. Computational Life Science

Universität zu Lübeck

2006 – 2011

### LANGUAGES

German NATIVE  
English BILINGUAL  
French BASIC  
Latin BASIC