

# INNOVATION IN ACTION

## *EPIIC Team Stories\_#4*

---

### MEET MATTHIAS FREY:

### Building the Future of Human-AI Teamwork

*"The goal of AI is not to replace human intelligence,  
but to amplify it"*

**MATTHIAS FREY**  
SENIOR SOFTWARE ENGINEER  
HAT.TEC GMBH



# Where a Childhood Dream Became a Lifelong Mission

---

***"Some childhood dreams fade with time; mine simply evolved"***, Matthias unfolds.

**Growing up, he was fascinated by Knight Rider.** While many people admired the sleek black sports car, he was captivated by something else entirely: **K.I.T.T., the intelligent onboard computer.** It wasn't just a machine; it was a trusted teammate, capable of thinking, communicating, and helping its human partner make better decisions. As a passionate science fiction fan, he spent countless hours creating his own stories, imagining heroes supported by intelligent spaceships and AI companions. Looking back, he realizes those stories shaped the questions that still drive his work today: *"How can artificial intelligence help people make better decisions? And how can humans and AI become true teammates?"*

Those questions eventually led him to study Computer Science and Artificial Intelligence and have guided every step of his professional journey

**Today, he is a Senior Software Engineer at HAT.tec GmbH,** where he designs human-autonomy teaming and decision-support systems for safety-critical environments. His work focuses on enabling effective collaboration between humans and intelligent machines, especially in situations where decisions must be made under uncertainty and severe time pressure.



**Before joining HAT.tec**, he worked as a Software Engineer in the medical domain at the Technical University of Munich, where he learned how software can directly improve people's lives. Later, he moved into automotive software engineering, gaining valuable experience in developing reliable software for safety-critical systems.

Those experiences taught him that advanced technology alone is never enough; *"it must also be trustworthy, transparent, and designed around the people who rely on it"*.

This naturally led him to pursue a Ph.D. in Engineering at the University of the German Armed Forces, Munich. His research focused on intelligent assistance systems that support human operators during tactical situation assessment and decision-making under time pressure.

By combining knowledge representation, information retrieval, and AI planning, he developed approaches that dynamically adjusted automation based on the current situation. The objective was never to replace the human operator, but to provide support exactly when it was needed while always keeping the human firmly in control.

That philosophy continues to shape his work today.

## Turning Research into Real-World Human-AI Teamwork

---

**Within the EPIIC project**, he has the opportunity to transform years of research into practical solutions. He works at the intersection of research, systems architecture, and software engineering, helping develop the Virtual Assistant and the Adaptive Human-Machine Interface to support pilots during future missions. His role ranges from understanding pilots' workflows and cognitive demands to designing AI capabilities, system architectures, and functional prototypes that demonstrate how humans and intelligent systems can work together seamlessly.



**What excites him most about EPIIC is that it brings** together experts from across Europe who share the same vision: creating the next generation of intelligent cockpit technologies. Every meeting is an opportunity to exchange ideas, learn from different disciplines and cultures, and explore technologies that may define the future of aviation. Seeing research evolve into working prototypes, and eventually into systems that could support pilots in real missions, is incredibly rewarding.

**Of course, designing AI for safety-critical environments** is far from simple. Every recommendation must be reliable, explainable, and delivered at exactly the right moment. The challenge is not simply building intelligent algorithms but creating systems that pilots can understand, trust, and collaborate with naturally. For Matthias, this is what Human-Autonomy Teaming is really about: combining the strengths of AI with human cognition instead of replacing it.

**One of the team's biggest milestones so far** has been developing the first functional prototype of the Virtual Assistant. What started as a conceptual idea is now becoming a tangible demonstration of future human-machine collaboration. Partners are already moving toward more advanced agentic AI capabilities, enabling the Virtual Assistant to evolve from an intelligent assistant into a proactive teammate while always keeping the pilot at the center of every decision.

**Those experiences taught him** that advanced technology alone is never enough: "it must also be trustworthy, transparent, and designed around the people who rely on it." - very much like the trusted intelligent companion he had admired as a child in K.I.T.T.

# Innovation, Creativity, and the Journey Ahead

**Working on EPIIC has also been an incredible personal journey.**

Beyond the technical achievements, it has taught him the importance of international collaboration, clear communication, and genuinely human-centered engineering. When he is not designing AI systems, he enjoys spending time outdoors with his dog, hiking through the mountains or walking in the forest. He also enjoys bouldering, going to the gym, and meeting friends for good food and conversations. And because his curiosity rarely switches off, he often spends his free time exploring new AI technologies or programming personal projects, not because he has to, but because he genuinely enjoys creating and learning.

One thing that surprises many people is that he also creates pixel art. He designs digital artwork pixel by pixel in the style of classic 1980s and 1990s video games. It is a creative and almost meditative hobby that perfectly balances his engineering work and reminds him that both art and software begin with the same thing: *"building something meaningful, one small piece at a time"*.

Looking back, he feels grateful to be part of the EPIIC project. It demonstrates what European cooperation can achieve when experts from different backgrounds work toward a shared vision.

*"Technology reaches its full potential only when it empowers people."*