

Local Multi-Agent AI Systems

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Local AI

- **Started with Ollama** - fascinated by local models
 - Experimented with LLMs, Stable Diffusion, Flux
 - Strong believer in **learning by experimenting**
 - Building production systems for University of Akureyri

Used Yin & Ollama at **30,000 feet** working on these slides!

"Local AI models have their place in the AI economy"





Dev

Orchestrator

Agents

What is the most important part of a successful Agentic system?

USERS





Local AI is part of a broader ecosystem Not a replacement

- Understand **multi-agent patterns** for collaboration
- Achieve **technical feasibility** with modern quantization
- Enable **flexible deployment** - isolated, hybrid, or integrated

You don't “need” powerful hardware....

But it does not hurt....

My AI Lab Setup

- RTX 5090 + 4090
- RGB ´S...

Purpose:

- Experimentation & Production
- Part of the Borg infrastructure



Beyond Chat: Real Use Case



- **Multimodal Production Pipeline**

- **Fine-tuned Whisper** → Podcast transcription (local)
- **Gemini 2.5 Pro** → Episode summary & blog post
- **Image generation** → Visual prompts from mood
- **Music generation** → Suno prompts for soundtrack

Key Point: Local models can have a place in a larger architecture

You don't always need the largest “hammer”

Smaller models have their place:

- Clear, focused tasks with specific requirements
- Privacy-sensitive environments
- Offline or restricted network scenarios
- Rapid prototyping and experimentation

And its fun.....



Privacy & Professional Peace of Mind

It's not that cloud is unsafe - it's about user experience

- **Doctors & Lawyers:** Regulatory compliance made simple
- **Researchers:** Complete data sovereignty
- **Developers:** Unrestricted experimentation

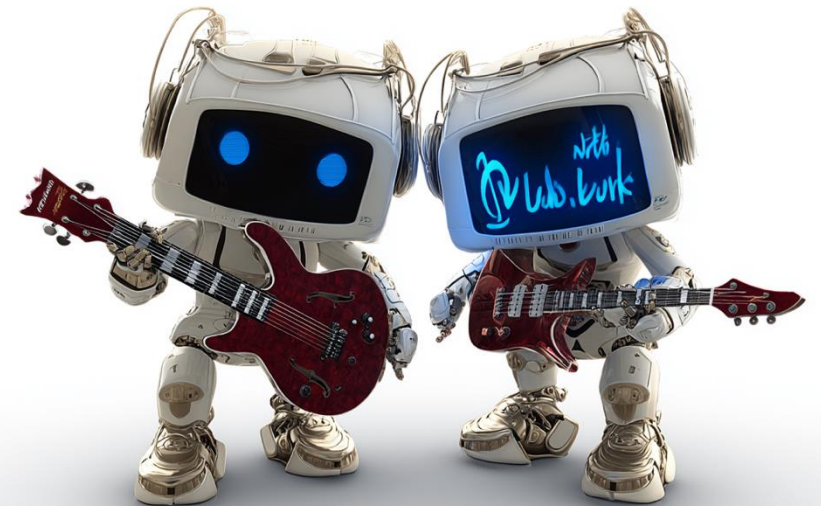
"There's a unique calm in an unplugged AI sandbox"



Multi-Agent Research System - Live Demo Platform

Multi-Agent Research System - Live Demo Platform

- **Today's Agent Lineup**
 - **Principal Synthesizer** (deepseek-r1:8b)
 - **Domain Specialist** (qwen3:8b)
 - **Web Harvester** (qwen3:4b)
 - **Fact Validator** (phi4-mini)
 - **Quality Auditor** (phi4-mini)

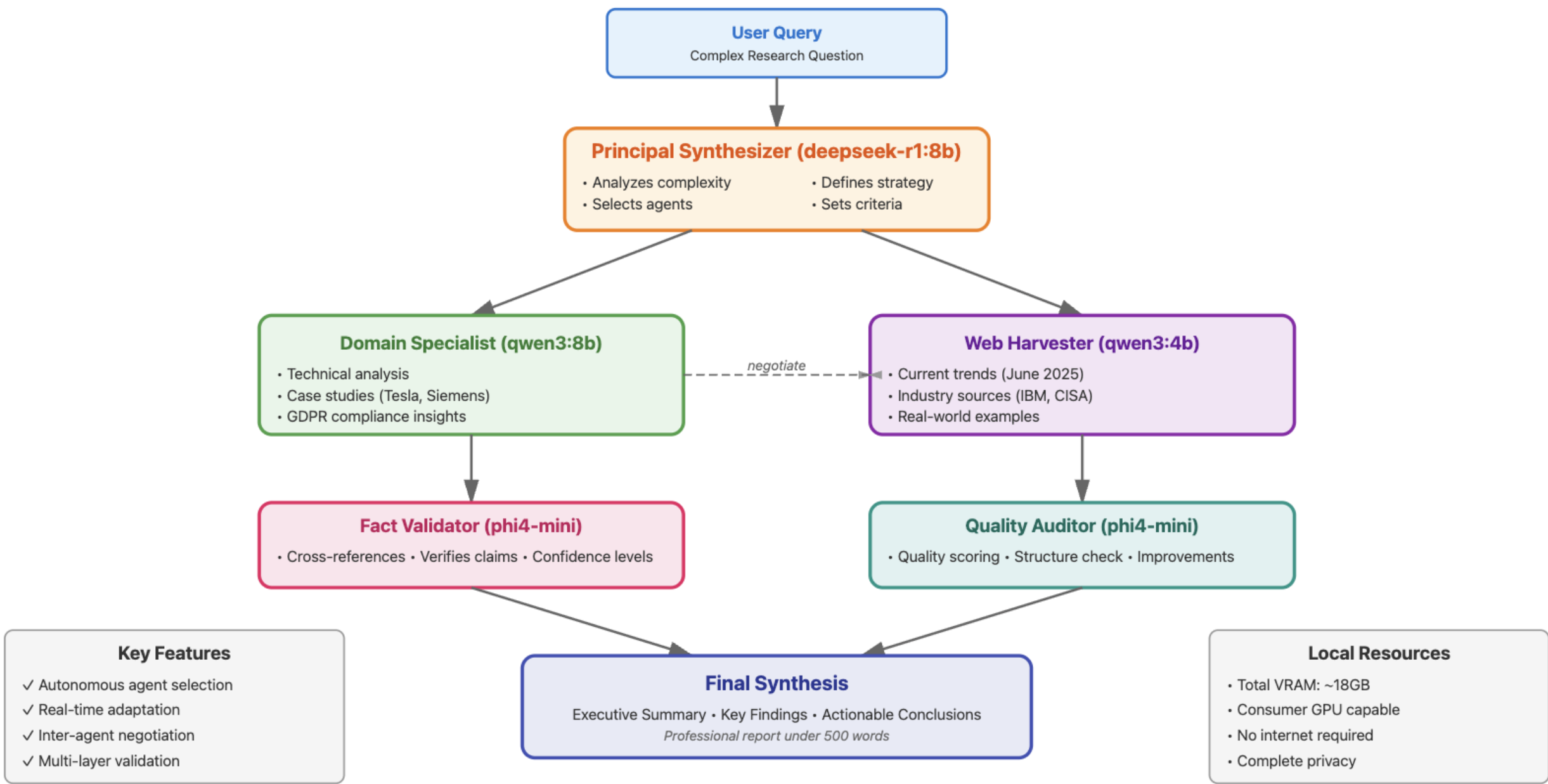




Why These Models?

- **Optimized for speed** in live demos
- **Total VRAM:** ~18GB
- **Consumer hardware** compatible
- **Real reasoning** capabilities

Multi-Agent Research System Workflow



How This Is Truly Agentic

Agent Feature	Our Implementation
Autonomy	Agents self-select based on query complexity
Reactivity	Real-time adaptation to research findings
Proactivity	Agents suggest follow-up investigations
Social Ability	Inter-agent negotiation for conflict resolution

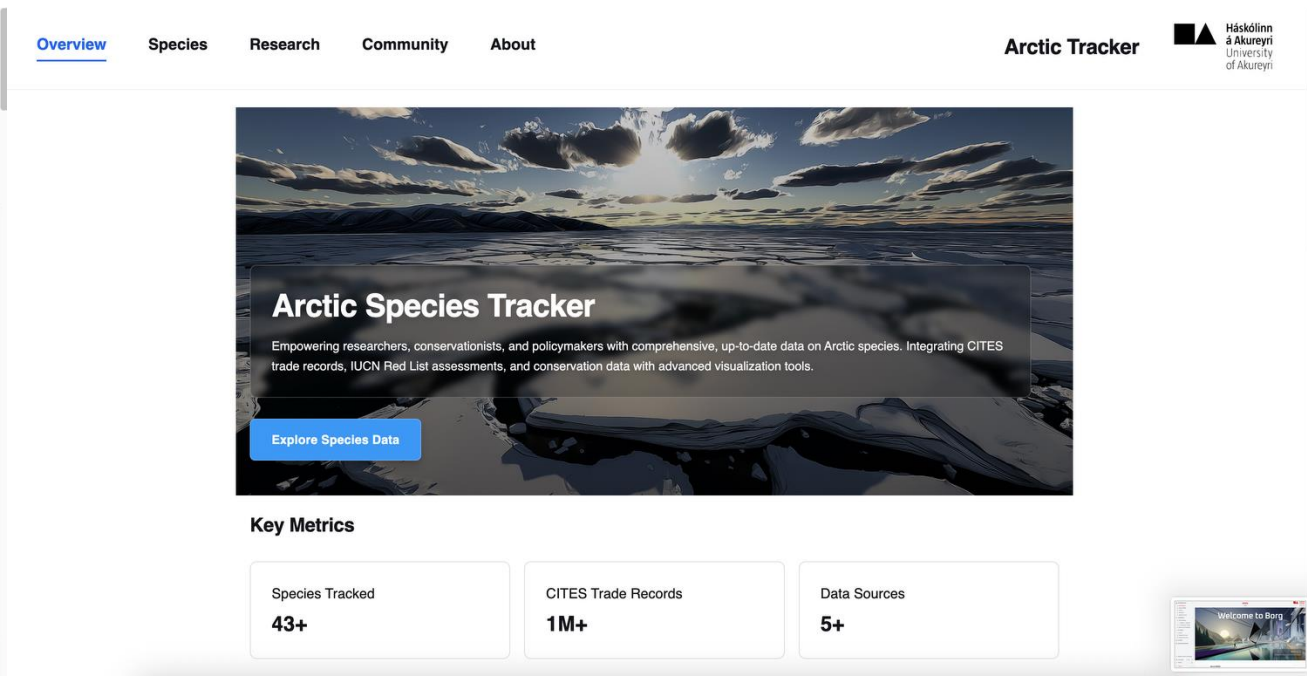
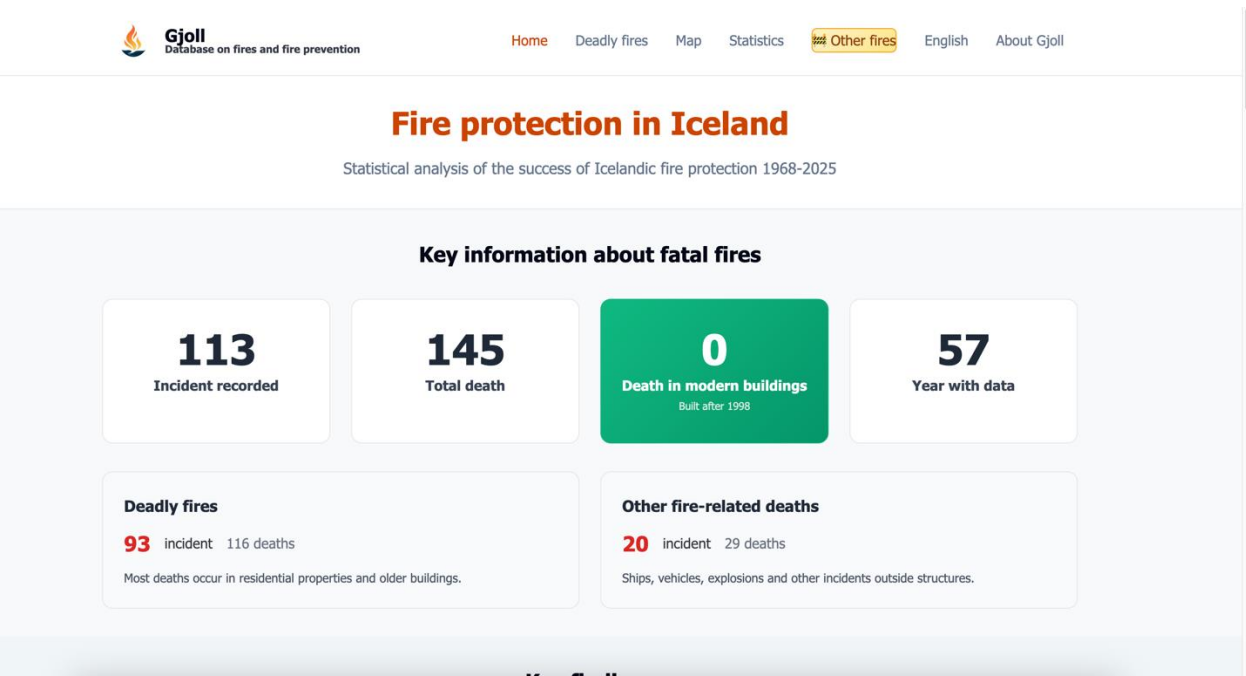
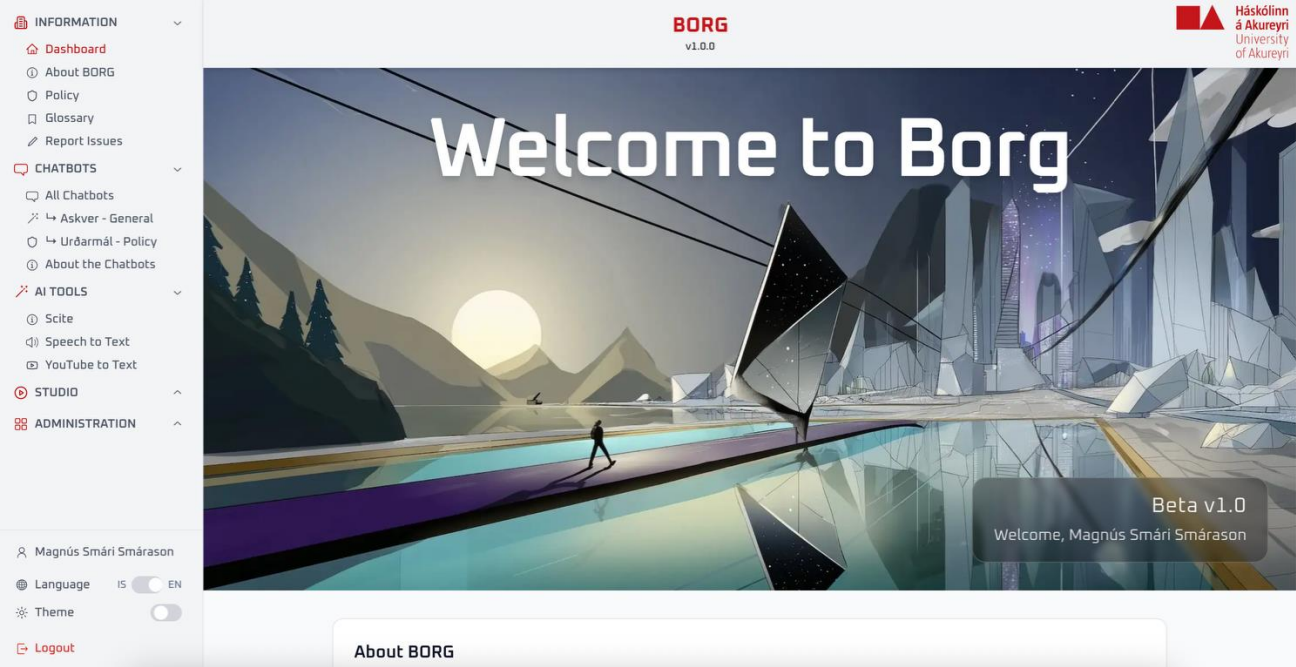
Custom framework



AI Project Manager at Háskólinn á Akureyri

- Developing and implementing the AI strategy at the University of Akureyri.
- Training and supporting staff in AI adoption.
- Managing AI software procurement and integration.
- Establishing a sandbox environment for AI experimentation.
- Creating an AI readiness index and risk assessment framework

Current project highlights:



You are only limited by you imagination

From my youth science workshop this week:

**“If you understand AI capabilities and limitations,
your biggest restriction is your imagination.”**

Build something!



Thank you !

Connect

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Github repo

