Integration of Artificial Intelligence in Education and Software Development

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Introduction

- **Presenter:** Luna Schätzle – Project Lead (AI evaluation, backend & website)
- **Objective:** Open-source AI platform for education
- **Focus:** Evaluate various AI models for multiple use cases
- **Platform:** Enable students to access and experiment with AI
- **Motivation:** Overcome high resource requirements of current Open Source AI models

Project Team and Management

- Team members: Luna Schätzle, Florian Prandstetter
- Project management: We had serveral meeting to discuss the project and to plan the next steps.
- Tools used:
  - GitHub for version control
  - Discord for communication
  - Google sheeds for Time tracking
  - LaTeX for documentation

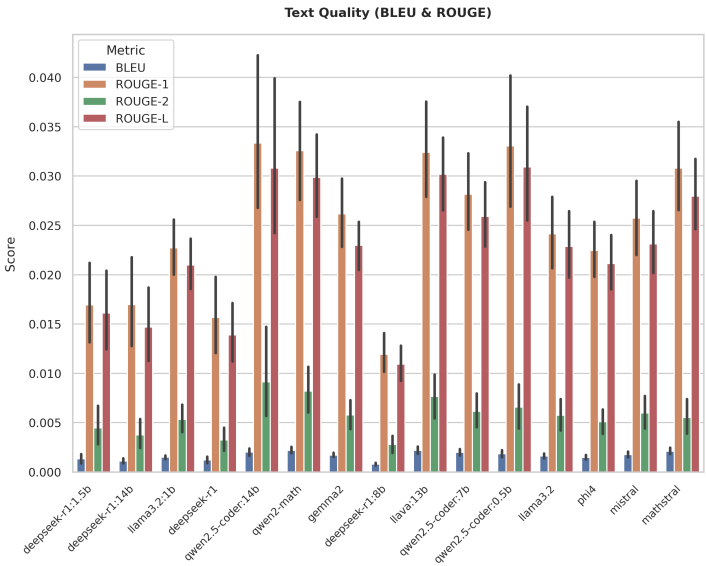
Theoretical Background

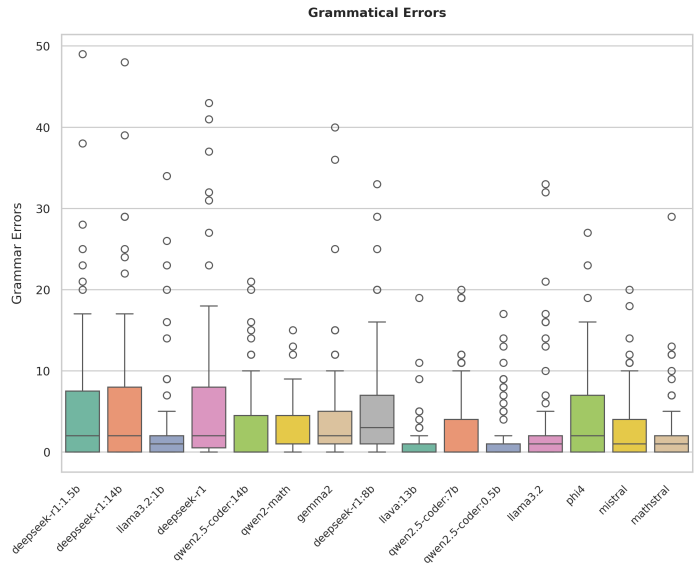
- Technologies used: Python, Flask, Vue.js
- Use of Large Language Models (LLMs)
- Interfacing methods: API, local models (Ollama), OpenAI
- Testing and evaluation of the open source models

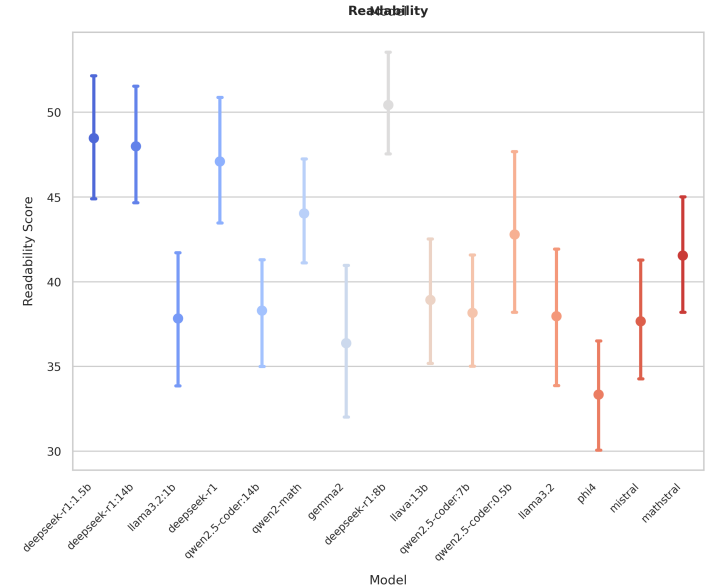
Testing and Evaluation

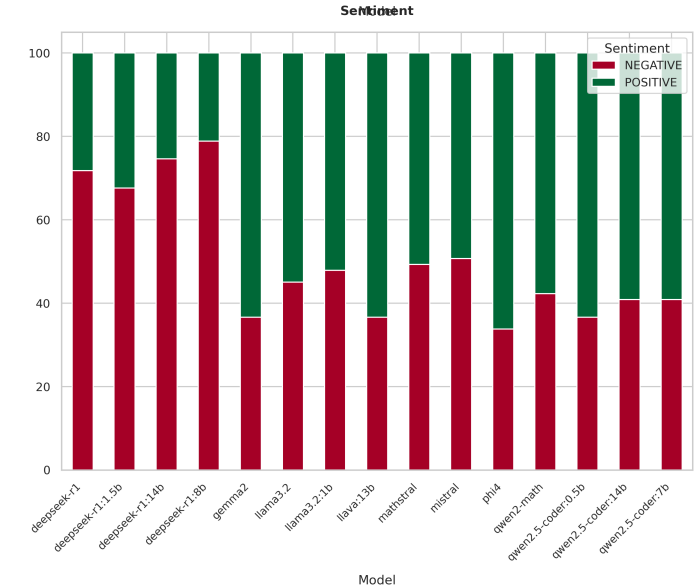
- Evaluation of models: Llama3.2, Deepseek-r1, gemma2, qwen, ...
- Testing methods: Different prompts and tasks where asked the models (automated via Python script)
- Evaluation criteria:
  - response time
  - accuracy
  - resource usage
  - BLEU score
  - readability
  - Textquality

Evaluation Results: Quantitative metrics









Evaluation Results: Qualitative metrics

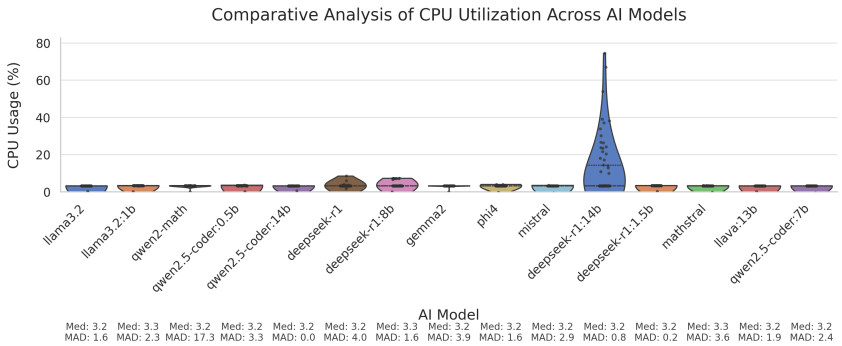


Figure: CPU Usage Comparison

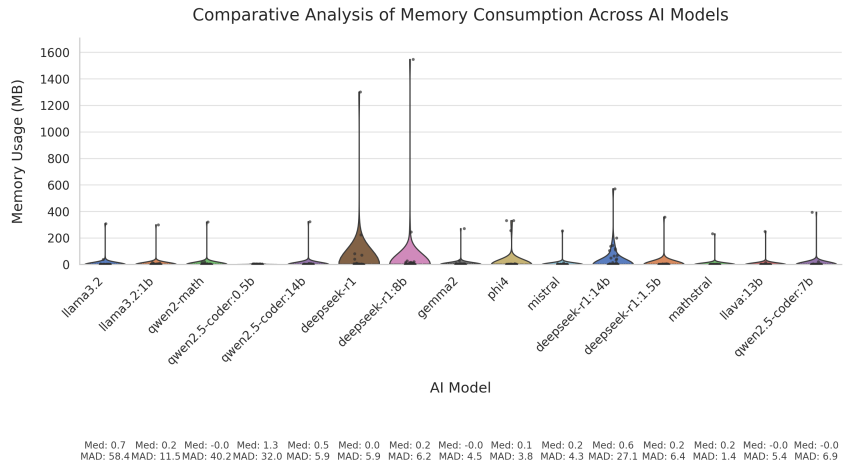


Figure: Memory Usage Comparison

Website Platform

- To realise the vision of the project, we created a website platform.
- The website was realised thru the use of Vue.js and Flask (Backend API) and Firebase (Database).
- The website has the following features (as of the presentation date):
  - User registration, login and profile management
  - Chatbot interface a various AI models (thrue API general local models, Programming Assistant, Chat with chat GPT, image regocnition via LLaVA and Llama3.2-vision)
  - Image generation with DallE
  - OCR (Optical Character Recognition) with Tesseract and enhanced via LLama3.2

AI in Economics and Ethics

- Applications
  - Customer service
  - Supply chain management
  - Predictive analytics
  - Data analysis
  - Automation
- Training data and ethical consernes
  - Bias in training data
  - Transparency and accountability
  - Privacy and data protection
  - Job displacement
- Regulatory challanges
  - lack of clear regulations
  - Global nature of AI
  - EU AI Act
  - Need for international cooperation
  - Data security and privacy

Open Source Contribution

- Definition and philosophy of open source
- Our project's open-source components
- Economic and societal advantages

Conclusion

- Summary of achievements
- Insights gained during the development
- Future potential of the system
- Final thoughts and acknowledgments

Florian