

How to Train Your Large Language Model 2

(HTYLLM2)

Prof. Dr. Axel Ngonga

Tutor: Nikit Srivastava



Data Science Group
Paderborn University

Project Group - SoSe 2025

February 9, 2026

Language Models

Introduction

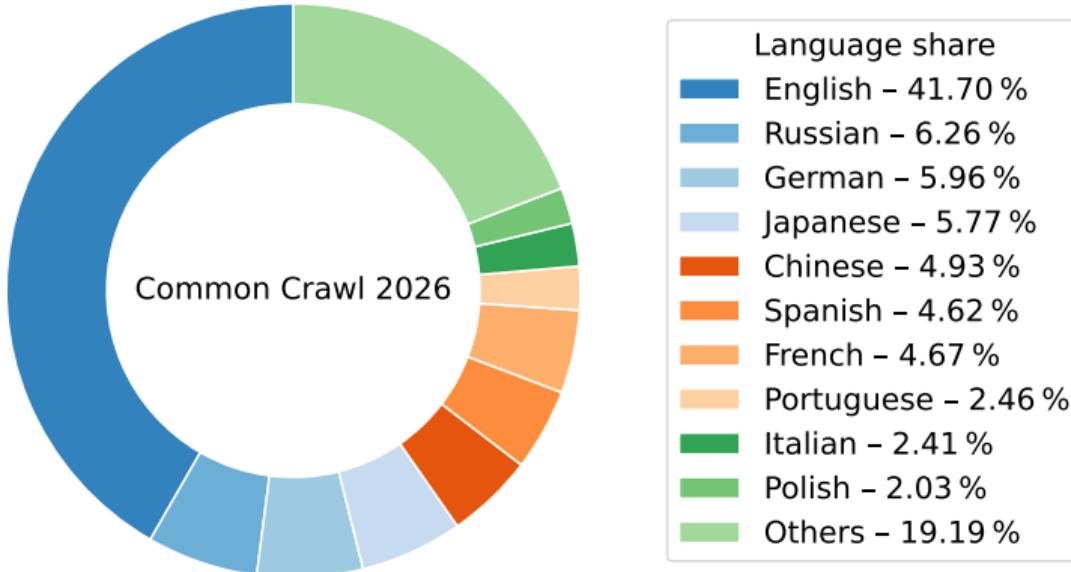
- ▶ Widespread adoption
- ▶ Application diversity
- ▶ AI-driven efficiency
- ▶ Continual advancements



Image sources: vecteezy.com, flaticon.com, iconscout.com

Language Models

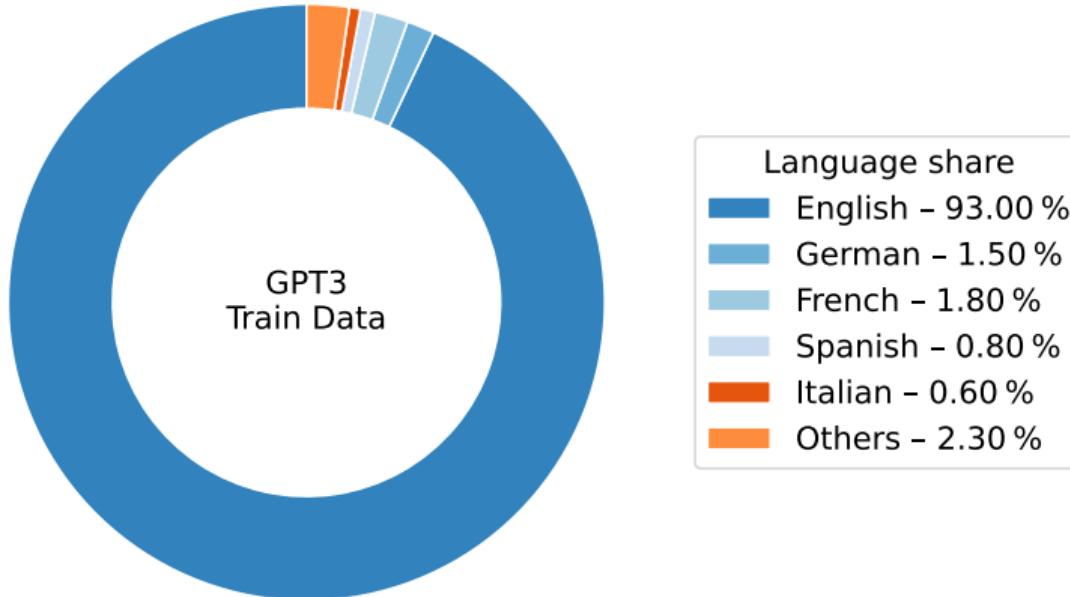
Training Corpus



Ref: <https://commoncrawl.github.io/cc-crawl-statistics/plots/languages.html>

Language Models

Training Subsample



Ref: Johnson et al., 2022

Language Models

Shortcomings

Multilingual Gaps

- ▶ English centric ([Üstün et al., 2024](#))
- ▶ Limited multilingual coverage ([Liu et al., 2024](#))
- ▶ *The curse of multilinguality* ([Conneau et al., 2020](#))

Open Source Limitations

- ▶ Pay-to-use or hidden behind APIs (e.g., GPT5, Gemini, Claude)
- ▶ Personal information requirements (e.g., Llama)
- ▶ Not very "open" models (e.g., Mistral, Grok, GPT-OSS)

Project Objective

Train a large and open-source multilingual language model and address the challenges posed by *the curse of multilinguality*.

- ▶ Support 500+ languages
- ▶ Ensure computational efficiency
- ▶ Enable multimodal capabilities
- ▶ Maintain linguistic extensibility



Image source: <https://de.freepik.com>

Project Tasks

What types of tasks will the project group be responsible for?

- ▶ Study SOTA models
- ▶ Gather training data
- ▶ Assess frameworks
- ▶ Implement custom models
- ▶ Create training/evaluation pipelines
- ▶ Document findings



Image source: <https://de.freepik.com>

Learning Expectations

What knowledge and skills can we expect to gain by participating in this project group?

- ▶ Advanced ML techniques
- ▶ LLM inner workings
- ▶ Distributed computing
- ▶ Research and literature review
- ▶ Project management and collaboration

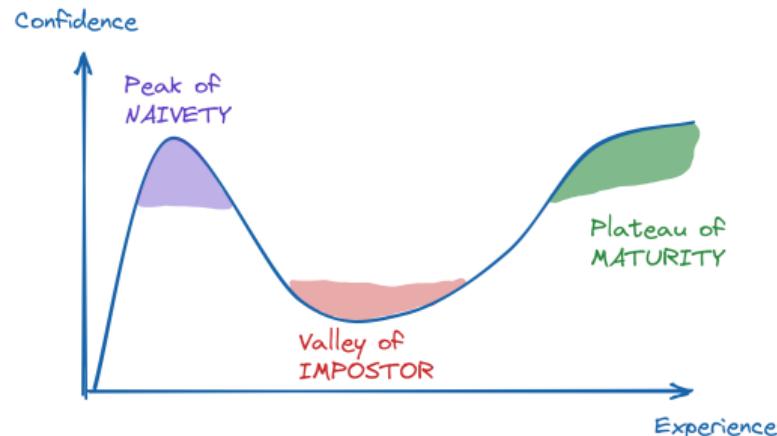


Image source: <https://newsletter.techworld-with-milan.com/>

Candidate Requirements

What is expected of the candidates applying to join this project group?

- ▶ Basic NLP and ML knowledge
- ▶ Python and shell programming
- ▶ Adapt to steep learning curve
- ▶ Strong problem-solving attitude



Image source: <https://de.freepik.com>

We Offer

- ▶ Expert tutors
- ▶ Training compute resources
- ▶ Follow-up thesis opportunities
- ▶ Publication support



That's all Folks!



dice-research.org/teaching/HTYLLM2-2026

Have questions?

Email: nikit.srivastava@uni-paderborn.de
Matrix: [@nikit:chat.dice-research.org](matrix://@nikit:chat.dice-research.org)