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now •

Typically Large Language Models (LLMs), are often associated with creative writing, email drafting, and even coding. But what about geometry?

📝 Just penned down an article exploring the intricate process of fine-tuning Large Language Models (LLMs) for geometric algorithms.

The Challenge: Geometry, especially shapes, remains largely uncharted territory for LLMs. While neural networks have made strides in geometric modeling, their inherently non-vectorizable nature poses semantic challenges.

The Solution: bridge this gap by translating geometric data into language. 🌐

🔍 The Example:
➡️ Fine-Tuning: fine-tune an LLM using textual descriptions related to profiles and their midcurves. This strategic approach refines the model for geometry-specific tasks.
➡️ 2D Shapes: the focus lies on 2D shapes, where aim is to generate midcurves.

🚀 Why It Matters:
➡️ No Midcurve LLMs: Currently, no readily available LLMs specialize in midcurve generation.
➡️ RAG Limitations: Retrieval Augmented Generation (RAG) isn't suitable due to the absence of vector embeddings for geometry

descriptions.

🔑 Key Takeaway: Fine-tuning LLMs with geometric data opens exciting possibilities for multidimensional 2D-3D applications. 💡

The advantages of fine-tuning lie in its control, adaptability, and optimization tailored to the specific task and dataset, ultimately leading to improved performance in midcurve generation.

For this project, I chose #CodeT5 as the base LLM for fine-tuning. Additionally, I leveraged several libraries:
➡️Hugging Face Transformers: This comprehensive NLP toolkit streamlined model loading, fine-tuning, and inference.
➡️PyTorch Lightning: Built on PyTorch, this framework provided robust infrastructure for training and deploying machine learning models.

I've documented the complete process in an article published by Analytics Vidhya on Medium. You can access it here: https://lnkd.in/diWWqYRx

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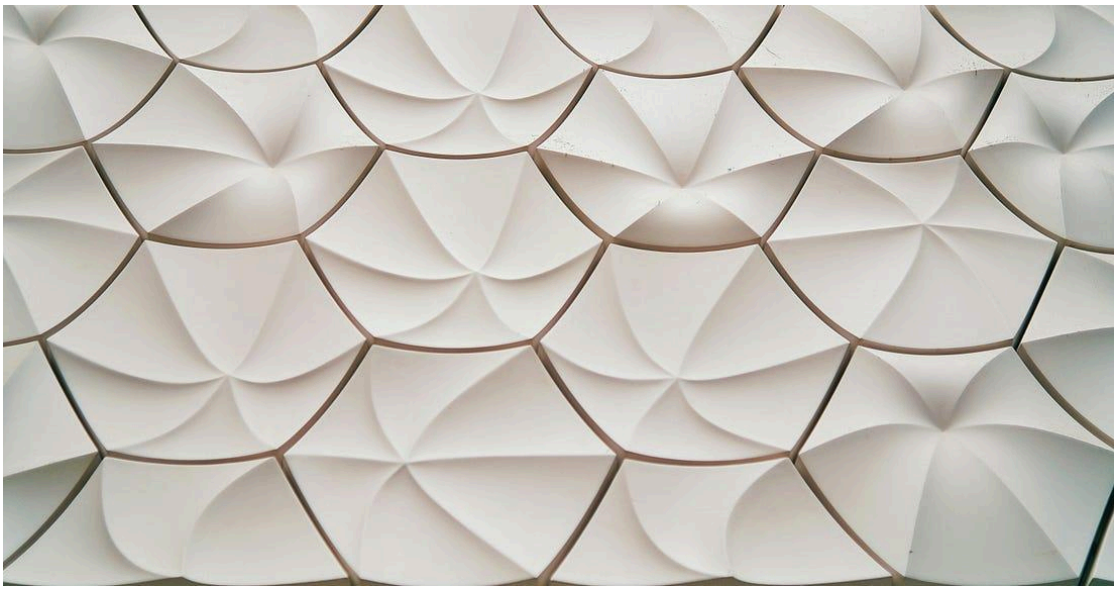

Tuning for Geometry

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