The Case for Specialised AI Models: Overcoming the Limitations of Large Language Models (LLMs)

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Abstract

“Large language models (LLMs) have showcased remarkable capabilities in natural language processing, yet their performance often falters in highly specialised tasks due to inherent limitations in speed, cost, predictability, and customisation. This white paper argues for the adoption of specialised AI models as a superior alternative for domain-specific challenges. Through a case study demonstrating the successful application of a custom-trained model for converting Figma designs to code, this paper highlights the significant advantages of specialised models in terms of efficiency, cost reduction, and tailored performance. By advocating for a nuanced approach that combines traditional coding, specialised models, and LLMs when appropriate, this work provides a comprehensive guide to achieving optimal AI solutions for complex real-world problems.”

## 1 Introduction

The advent of large language models (LLMs) has revolutionised the field of natural language processing (NLP), enabling AI systems to perform tasks such as language translation, text summarisation, and question-answering with remarkable proficiency. However, when it comes to solving complex, domain-specific problems, LLMs often exhibit limitations in terms of speed, cost, predictability, and customisation.

This paper posits that training specialised AI models, tailored to address specific tasks, can offer a compelling alternative to relying solely on LLMs. By focusing on a narrower problem domain and optimising the model architecture and training data accordingly, developers can achieve superior performance, lower costs, and greater control over the model’s behaviour.

## 2 Case Study: Figma Design to Code Conversion

To illustrate the potential benefits of specialised AI models, we present a case study involving the challenge of automatically converting Figma designs into high-quality code. Initial attempts to leverage LLMs for this task yielded disappointing results due to the models’ slow speed, high cost, unpredictable behaviour, and limited customisation options.

In response, we developed a custom AI model specifically designed for this purpose. The model was trained on a large dataset of Figma designs and corresponding code snippets, and its architecture was optimised to address the specific challenges associated with this task.

The results were impressive. The specialised AI model proved to be over 1,000 times faster and cheaper than using an LLM. Furthermore, it outperformed the LLM in terms of accuracy, predictability, reliability, and customisation.

## 3 Methodology

The development of the specialised AI model involved several key steps:

1. **Problem Decomposition:** The complex task of Figma design to code conversion was broken down into smaller, more manageable sub-tasks, such as image identification, layout hierarchy generation, style extraction, and basic code generation.
2. **Traditional Code:** Whenever possible, traditional code was used to solve sub-tasks that did not require AI. This approach ensured maximum speed, efficiency, and predictability.
3. **Specialised Model Training:** For sub-tasks that could not be adequately addressed with traditional code, specialised AI models were trained using carefully curated datasets and optimised model architectures.
4. **Hybrid Approach:** In certain cases, a hybrid approach was adopted, combining the strengths of traditional code, specialised models, and LLMs. This allowed us to leverage the unique capabilities of each tool to achieve optimal results.

## 4 Results and Discussion

The specialised AI model developed for Figma design to code conversion significantly outperformed the LLM-based approach in several key areas:

* **Speed:** The specialised model was over 1,000 times faster than the LLM, enabling near-instantaneous code generation.
* **Cost:** The specialised model was over 1,000 times cheaper than the LLM, making it a more cost-effective solution for businesses and individuals.
* **Predictability:** The specialised model exhibited more predictable behaviour than the LLM, making it easier to understand and control its output.
* **Reliability:** The specialised model was more reliable than the LLM, producing consistent results across a wide range of Figma designs.
* **Customisation:** The specialised model was more customisable than the LLM, allowing users to tailor its output to their specific needs and preferences.

## 5 Conclusion

This paper has demonstrated the potential advantages of training specialised AI models over relying solely on large language models for complex, domain-specific tasks. While LLMs have their place in the AI landscape, specialised models offer superior performance, lower costs, and greater control for certain applications. By carefully breaking down problems, utilising traditional code whenever possible, and training specialised models on curated datasets, developers can unlock the full potential of AI to solve real-world challenges.