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Using Small Language Models For Local Email Categorization Into Variable Number Of User-Defined Labels

This paper presents a novel approach, **Analyze-Select-Match (ASM)**, for local email categorization using small language models. The objective is to enable users to organize emails on their local machines by categorizing them into **user-defined labels with flexibility in both quantity and quality**. A dataset of email samples was curated, and five models, sized for widespread graphics card compatibility, were tested using various prompt engineering techniques. The highest achieved accuracy was 97\%, with a focus on maintaining efficiency measured by the accuracy-to-average time ratio for classifying a single message. The proposed ASM methodology, emphasizing Analyze, Select, and Match stages, proved efficient without the need for retraining, making it suitable for quick transitions between tasks. The models' performance and efficiency were visualized, with the openhermes mistral 2.5 7b model and cot_1 prompt combination achieving the highest accuracy. The developed model fulfills expectations of high accuracy, efficient processing time, effective performance, agent capability, compact model size, high availability, small contextual footprint, and full customization. This research contributes a valuable methodology and insights for practical and **customizable local email organization**.

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