

Recreating property boundaries from old maps and cadastral records using AI: The case of Røst, Norway

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SUMMARY

Previous work has shown how machine learning algorithms can be used to analyze old maps for cadastral purposes. Machine learning can help with both segmentation and georeferencing tasks, assisting the cadastral surveyor by automatically identifying and extracting boundary points, lines or polygons and suggesting coordinates for them. However, such techniques are still in their infancy and the accuracy varies greatly between different approaches and use cases. In this paper, we present a case study of old maps and cadastral records from the island of Røst, Norway. The maps and records in question have been used extensively in a recent cadastral survey of the island, providing a useful baseline for evaluation of AI techniques.

We examine the use of multimodal large language models like GPT-5, enhanced by a heuristic where we first ask about the spatial relations between property parcels and between property parcels and other identifiable or known objects in the area. We show that this may increase performance compared to an approach where we ask directly for georeferenced information about individual property boundaries. We speculate that this is because we prompt the algorithm to reason more holistically about how the parcels in the area “fit” together, allowing it to make use of more information to carry out more complex reasoning steps pertaining to relative locations. While the work is still in the early stages, we argue that it shows promise, suggesting that we may in the future be able to automate the creation of complex cadastral reference maps based on historical data, including large amounts of text. We also consider possible implications of this scenario for the working surveyor and the legal framework currently in place in Norway.

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