

Oral History, Historical Aerial Photography, and Machine Learning in Namibia and Sri Lanka

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Abstract

The use of historical aerial photography offers the potential to quadruple the time-depth of available geo-spatial mass data from 20 years to 80 years to assess past, present and future environmental and climate change. While satellite imagery only attained sub-1-meter resolution in the early 2000s, aerial photography with the same resolution had already become ubiquitous in the 1940s, covering all land territories across the globe at 5-10 years intervals. A huge challenge, however, is how to interpret the features visible on historical aerial photography because the environments depicted in the imagery have been dramatically transformed by development, population growth, and modernization. As a result, conventional ground truthing to assess what the features visible in the photographs represent in the real world is no longer possible. The authors propose to use a new historical ground truthing methodology using life history interviews to compile data on land use, climate, vegetation, and the environment *contemporary* to the times series of historical aerial photography for each case study. This methodology will allow more historically accurate interpretation of the aerial photography and facilitate developing machine learning data sets and culminate in the ability to machine-read historical aerial photography for a more comprehensive understanding of environmental and climate change from the 1940s through today.

Keywords: historical aerial photography, climate change, territory, modernization, machine learning