LEGO Cartography: From Practice to Framework

Atlas (Chenxiao) Guo [1]*

[1] Department of Geography, University of Wisconsin-Madison, Madison, U.S.A
* atlas.guo@wisc.edu

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Introduction

Maps have never been confined to paper or screen. Cartography has a long tradition of working with physical media, such as terrain relief models, sand tables, and tactile maps, which allow geographic space to be represented, interpreted, and experienced through material form (Cole, 2021). Beyond academia, LEGO has emerged as an unlikely yet productive mapping medium, with independent My Own Creation (MOC) builders constructing increasingly sophisticated spatial representations. However, brick-based mapping has yet to be examined through a systematic cartographic framework. This work documents an ongoing practice-based exploration and tentatively proposes a preliminary framework of LEGO Cartography, offered as a starting point for discussion rather than as a definitive statement.

Method

LEGO Cartography refers to the practice and study of representing geographic space using standard-scale compatible bricks under the guidance of cartographic principles. The term is adopted here as a recognizable label rather than a brand endorsement, and its scope includes LEGO and third-party brick systems compatible with the standard scale, while those with substantially different scales or part structures are excluded.

This work mainly draws on two map types: topographic/general/reference LEGO maps that encode elevation through stacked brick layers and/or color gradients, and thematic LEGO maps that apply various symbolization to communicate attribute data. In terms of forms, both physical builds and digitally rendered images are considered, as each mode offers distinct affordances for material engagement, visual communication, annotation, and reproduction.

LEGO as the mapping medium imposes these distinctive constraints: (1) forced discretization, in which the brick grid pixelates space into fixed units; (2) palette constraint, where the finite color system requires all schemes to be approximated within the available brick colors; (3) parts constraint, in which available brick types and quantities limit resolution, symbol complexity, and construction feasibility; (4) labeling constraint, since text integration is extremely limited in physical form and often requires external annotation; (5) layout constraint, as the available baseplate restricts map extent

and compositional freedom; and (6) height as an additional visual variable, since physical builds can encode elevation through vertical stacking.

These constraints position LEGO Cartography as a practice where foundational issues of map projection, scale, generalization, symbolization, color, typography, visual hierarchy, and layout arise in unusually explicit form.

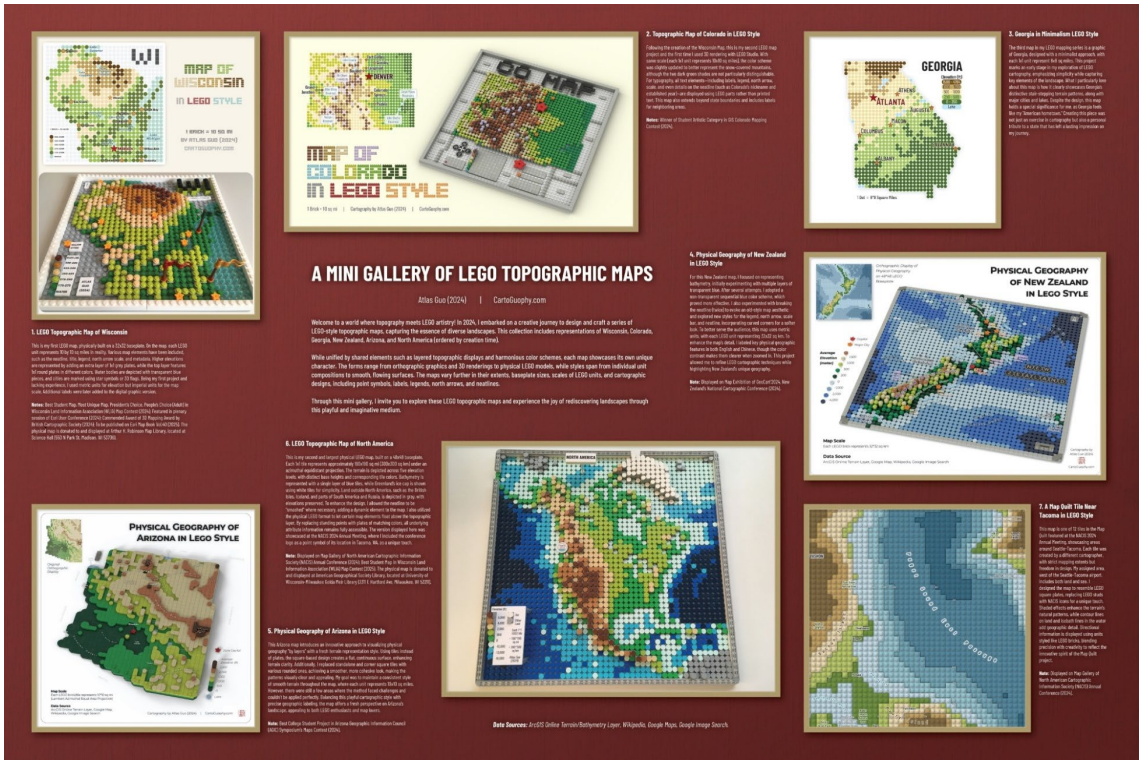

Figure 1: Examples of LEGO topographic maps.

Results

This project has produced more than a dozen physical builds and over 30 digital images of topographic and thematic maps, partly illustrated in Figure 2. These works also reveal several practical challenges, such as color accessibility under LEGO's limited palette, possible misreadings of scale and accuracy, inconsistent terminology for LEGO elements, and differing reading habits and expectations between cartographic and LEGO audiences.

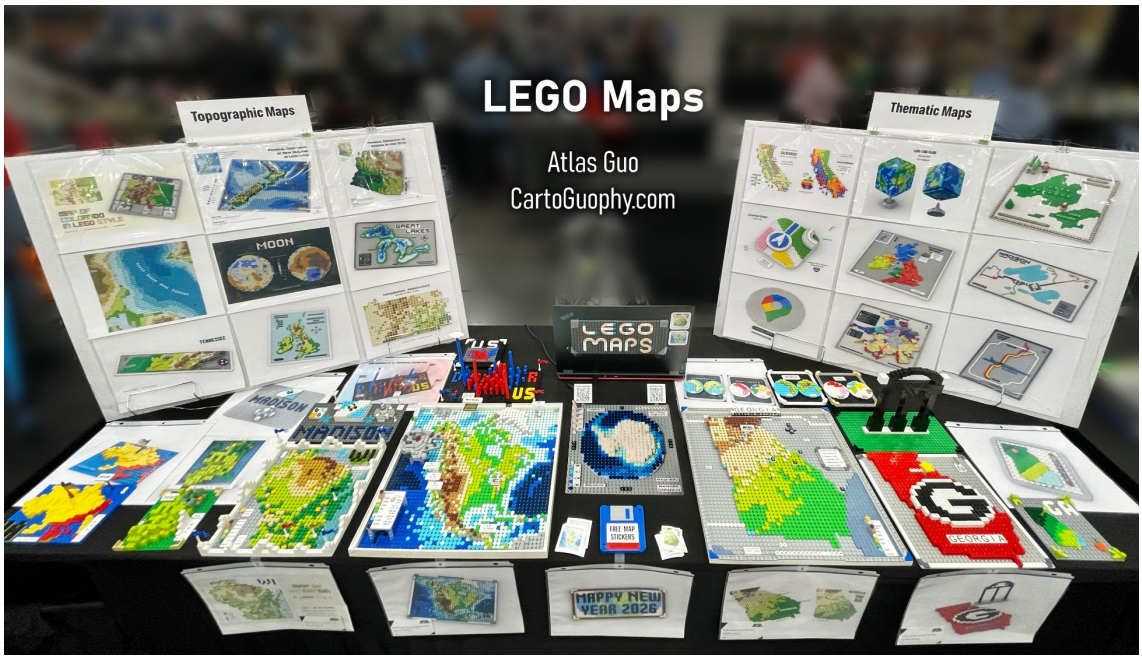

Figure 2: Examples of physical and digital LEGO maps.

Building on these cartographic practices, this work proposes a preliminary framework for LEGO Cartography comprising five modules: (1) LEGO Cartography Foundations, (2) LEGO as Cartographic Medium, (3) Spatial Foundations of LEGO Cartography, (4) LEGO Map Design and Representation, and (5) LEGO Map Use and Communication. Each module surfaces questions that are both specific to the LEGO/brick medium and reflective of broader cartographic theory. The full framework is presented in Figure 3.

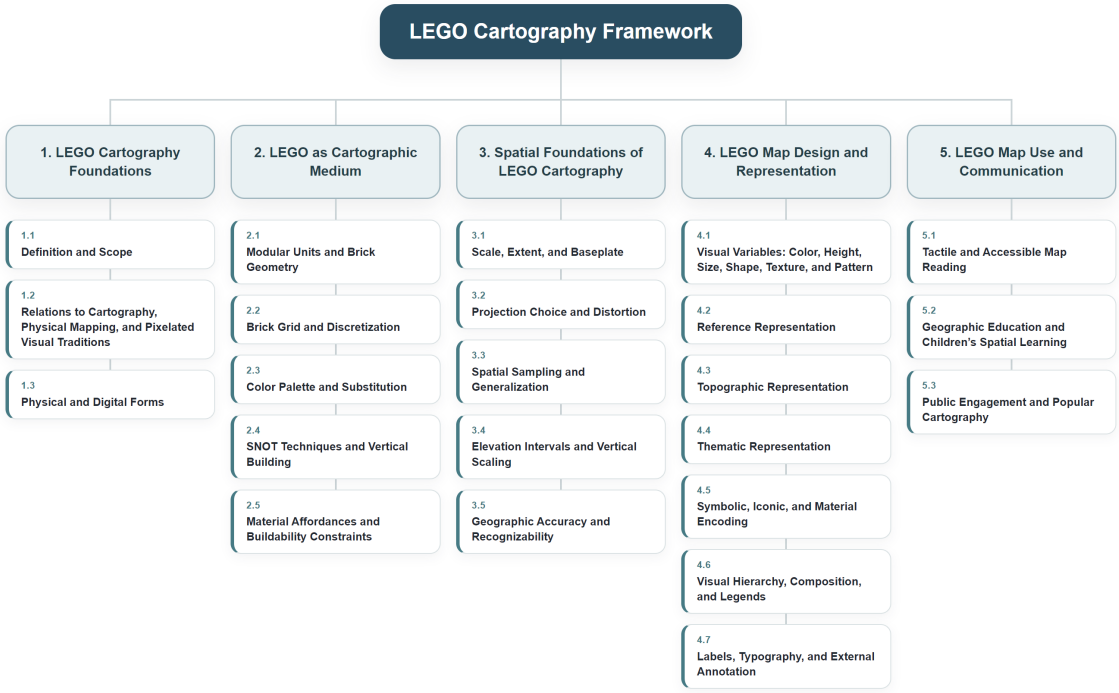

Figure 3: Proposed preliminary framework for LEGO Cartography.

Discussion and Conclusion

This work is an initial attempt to move LEGO Cartography from individual making toward systematic cartographic discourse. By treating brick-based maps as both material artefacts and analytical devices, it shows how an unconventional medium can open new ways to examine representation, abstraction, and communication in cartography. The proposed framework is therefore not a final model, but a foundation for further discussion, refinement, and comparative study.

Its significance also extends beyond cartographic theory. LEGO Cartography may offer a tangible platform for geographic education, inclusive and tactile cartography, community mapping, and public science communication (Cole, 2021; Guo, 2026), inviting further experiments, discussions, and collaborations within and beyond the mapping community.

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