Dear Editor,

We wish to submit an original research manuscript entitled “Decoding (urban) form and function using spatially explicit deep learning” for consideration by Computers, Environment and Urban Systems. We confirm that this work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere.

The paper builds on previous publications by the same authors, that introduced a classification of space into "spatial signatures" based on form and function of each bespoke spatial unit across the entirety of Great Britain. The presented manuscript uses the classification as one of the data inputs, focusing on application of deep learning and spatially explicit methods built on top it, and their ability to decode "signatures" from openly available satellite imagery.

One of the key components of the work is the focus on open data and open tools and understanding how far can we get when the whole work is restricted to open data only, which can make a significant difference when talking about satellite imagery.

The method offers a novel approaches of chip sampling, making use of geographical nature of satellite imagery, and an application of spatial modelling on top of the probability matrices provided by conventional deep learning computer vision models.

The work is fully reproducible with code, data, and a reproducible containerized environment.

We have no conflicts of interest to disclose.

Thank you for your consideration of this manuscript.

On behalf of the authors,

Martin Fleischmann, Charles University & University of Liverpool