

# Solid Physical Objects: Parthood, Damage and Beyond

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The objective of this research project is a comprehensive representation of solid physical objects, including their parthood relations and a way of reasoning about how such objects can be damaged. Our research questions and ontological commitments are raised from motivating scenarios in manufacturing and ecommerce domains. We use a bottom-up approach to construct a system of foundational ontology modules and employ top-down verification to validate the correctness and completeness of the semantics. Currently, following the mereological pluralism approach, we completed a system of multiple parthood relations that are grounded by foundational ontology modules, which we coordinated into the Ontology of Solid Physical Objects (SoPhOs). SoPhOs is a general suite of upper ontology modules we proposed and axiomatized in First Order Logic. In addition, the units of measure of physical objects are discussed in FOUnt, and the representation to damage of solid physical objects is enabled through the comparison of abnormalities with intended properties.