

Peer Review

# Review of: "Evaluating the Application of SOLID Principles in Modern AI Framework Architectures"

Rajesh Vasa<sup>1</sup>

1. Deakin University, Australia

The paper aims to investigate how well two widely used AI frameworks—TensorFlow and scikit-learn—conform to the five SOLID object-oriented design principles. A few selected classes were examined; it uses mostly a qualitative lens. It concludes that strict SOLID adherence is difficult, but each framework makes context-sensitive trade-offs. The current literature in software engineering shows that all choices are context-sensitive and loaded with trade-offs; and adherence to any principles strictly is neither feasible nor necessary; in fact, my own works in software evolution show that you need to avoid certain principles to get an efficient and useful design -- for instance, SE asks you to avoid "god-classes"; but real-world metrics show that almost all software systems have these god-classes and, in essence, some set of these large complex components is helpful to connect the dependency graph better.

To improve this work,

- Adopt a mixed-method research method or protocol: quantify first (use tools such as PyAnaconda, ClassResponsibility coupling metrics, SOLID-meter plugins) to compute adherence scores across the whole codebase; qualify second with targeted code reading and developer interviews. The metrics are not necessarily perfect, but a necessary step to have some reference to work with.
- Specify the evaluation rubric ahead of time and provide a rationale.
- Look at other frameworks and libraries; otherwise, the conclusion can be criticised as "selected the set of classes that will align to my conclusion."
- Control for framework version: Allows for some insight if seen with an evolution lens.
- Grounded empirical validation: Does it matter that these principles were not followed strictly? Does it mean we get more defects? Is more maintenance done because of it?
- Threats to validity section: Generally needed for empirical works and should be added for

completeness. Explicitly discuss construct, internal, and external validity, plus researcher bias.

- Reference quality and style: Consistent bibliography format, link to more recent and well-known landmark papers to better contextualise.

## **Declarations**

**Potential competing interests:** No potential competing interests to declare.