### Checklist for Quantitative Study Quality Assessment

#### ITEMS TO RANK STUDY QUALITY

**A Framework for Classifying and Comparing Architecture-Centric Software Evolution Research**

**General items: G\(^1,2,3\)**

1. **Problem definition of the study. Options are:**
   - (2) The authors provide an explicit problem description for the study.
   - (1) The authors provide a general problem description.
   - (0) There is no problem description.

2. **Environment in which the study was carried out. Options are:**
   - (1) The authors provide an explicit description of the environment in which this research was performed (e.g., lab setting, as part of a project, in collaboration with industry, etc.).
   - (0.5) The authors provide some general words about the environment in which this research was performed.
   - (0) There is no description of the environment.

3. **Research design of the study refers to the way the study was organized. Options are:**
   - (2) The authors explicitly describe the plan (different steps, timing, etc.) they have used to perform the research, or the way the research was organized.
   - (1) The authors provide some general words about the research plan or the way the research was organized.
   - (0) There is no description of how the research was planned / organized.

4. **Contributions of the study refer to the study results. Options are:**
   - (2) The authors explicitly list the contributions/results of the study.
   - (1) The authors provide some general words about the study results.
   - (0) There is no description of the research results.

5. **Insights derived from the study. Options are:**
   - (2) The authors explicitly list insights/lessons learned from the study.
   - (1) The authors provide some general words about insights/lessons learned from the study.
   - (0) There is no description of the insights derived from the study.

6. **Limitations of the study. Options are:**
   - (2) The authors explicitly list the limitations/problems with the study.
   - (1) The authors provide some general words about limitations/problems with the study.
   - (0) There is no description of the limitations of the study.

**Specific items: S**

1. **Main focus of the paper. Options are:**
   - (2) Application of formal theory to enable architectural property analysis
   - (1) Architecture-centric evolution and property analysis
   - (1/2) Architectural evolution
   - (0) Formal theory to specify architecture without any evolutionary purposes

2. **The architecture descriptions presented in the studies. Options are:**
   - (2) Formally specified by a formal theory
   - (1) Specified by an ADL
   - (0) Specified informally

3. **Architectural properties in terms of constraints. Options are:**
   - (2) Formally specified by a formal language
   - (1) Specified by a constraint language
   - (0) Specified informally

4. **Evaluation of the study. Options are:**
   - (2) Theoretical reasoning is part of the evaluation
   - (1) Some informal evidences are provided
   - (0) Non-justified or ad-hoc validations

**Ranking formula:**

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rac{(G_1+G_2+G_3+G_4+G_5+G_6)}{11} + \frac{(S_1+S_2+S_3+S_4)}{8} + 3
\]

4 = Quality papers; 3: Acceptable; 2, 1, 0: Excluded

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