Lightning Talk: Software Citation: Process, Principles, and Implementation

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WSSSPE4
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https://github.com/force11/force11-scwg
Process

- April 2015: FORCE11 started Software Citation Working Group
- October 2015: WSSSPE3 software credit group joined
- October 2015–April 2016: reviewed 47 documents describing existing community practices, and developed set of 16 use cases for SW citation
- April 2016: FORCE2016 one-day workshop & public presentation
- > April 2016: updated document published on FORCE11 website for public comments via Hypothesis
- June 2016: submitted paper to PeerJ CS, made draft available via PeerJ Preprints
- August 2016: software citation principles paper accepted
Principles

1. **Importance:** software as important as other research products

2. **Credit & attribution:** citations should facilitate scholarly credit and attribution to all contributors

3. **Unique identification:** citation should include machine actionable, globally unique, interoperable, and recognized identification method

4. **Persistence:** Unique identifiers and metadata should persist

5. **Accessibility:** Citations should facilitate access to software and associated metadata

6. **Specificity:** Citations should facilitate identification of, and access to, specific version of software used
## Use Cases

<table>
<thead>
<tr>
<th>Use case</th>
<th>Basic requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unique identifier</td>
</tr>
<tr>
<td>1. Use software for a paper</td>
<td>●</td>
</tr>
<tr>
<td>2. Use software in/with new software</td>
<td>●</td>
</tr>
<tr>
<td>3. Contribute to software</td>
<td>●</td>
</tr>
<tr>
<td>4. Determine use/citations of software</td>
<td>●</td>
</tr>
<tr>
<td>5. Get credit for software development</td>
<td>●</td>
</tr>
<tr>
<td>6. &quot;Reproduce&quot; analysis</td>
<td>●</td>
</tr>
<tr>
<td>7. Find software to implement task</td>
<td>●</td>
</tr>
<tr>
<td>8. Publish software paper</td>
<td>●</td>
</tr>
<tr>
<td>9. Publish papers that cite software</td>
<td>●</td>
</tr>
<tr>
<td>10. Build catalog of software</td>
<td>●</td>
</tr>
<tr>
<td>11. Build software catalog/registry</td>
<td>●</td>
</tr>
<tr>
<td>12. Show scientific impact of holdings</td>
<td>●</td>
</tr>
<tr>
<td>13. Show how funded software has been used</td>
<td>●</td>
</tr>
<tr>
<td>14. Evaluate contributions of researcher</td>
<td>●</td>
</tr>
<tr>
<td>15. Store software entry</td>
<td>●</td>
</tr>
<tr>
<td>16. Publish mixed data/software packages</td>
<td>●</td>
</tr>
</tbody>
</table>


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Software citation principles

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Subjects: Digital Libraries, Software Engineering
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SOFTWARE CITATION PRINCIPLES

The main contribution of this document are the software citation principles, written fairly concisely in this section and discussed further later in the document (see Discussion). In addition, we also motivate the creation of these principles (see Motivation), describe the process by which they were created (see Process of Creating Principles), summarize use cases related to software citation (see Use Cases), and review related work (see Related Work). We also lay out the necessary future work (see Future Work).

1. Importance:
Software should be considered a legitimate and citable product of research. Software citations should be accorded the same importance in the scholarly record as citations of other research products, such as publications and data; they should be included in the metadata of the citing work, for example in the reference list of a journal article, and should not be omitted or separated. Software should be cited on the same basis as any other research product such as a paper or a book, that is, authors should cite the appropriate set of software products just as they cite the appropriate set of papers.

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Next Steps

• WSSSPE4 Track 1 discussions: future for software credit, reproducibility, & sustainability

• Paper on examples of software citation: https://github.com/force11/force11-scwg

• Infographic on principles

• Sunset of SCWG, spinup of follow-on Software Citation Implementation Working Group
Thank you! Questions?

https://www.force11.org/software-citation-working-group

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