Literature classification: Software Visualizations

Fill this form for each publication.

1. **Title of the article** *

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2. **Year of publication** *

   ....

3. **Publication forum** *

   Name of the conference / journal where the
   article is published.

   ....

4. **Keywords** *

   Copy the keywords of the article from the
   article or publisher page if not provided in
   the article (use controlled indexing terms for
   IEEE articles if keywords defined by authors
   are not available). If no keywords are
   available (even by publisher), answer "-".

   ....

Research Goals and Methods

5. **Main goal of the research** *

   Copy the main goals of the research from the article.

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6. **Main results of the research** *

Copy the main results of the research from the article.

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7. **Are research questions stated clearly?** *

Mark only one oval.

◯ Yes

◯ No

8. **What research methods have been applied?** *

Copy from the article if possible.

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9. **What is the problem domain visualization(s) contributes to in terms of software engineering?** *

To which kind of problem the study provides a solution? If the study does not introduce a new visualization method or tool answer what is the main focus of the study in software engineering perspective. E.g. a comparison study of visualization methods for software evolution would go to "Exploring change in software over time" group.
Check all that apply.

☐ Managing software projects (business aspects, software analytics)

☐ Defining and maintaining requirements (requirements engineering)

☐ Exploring change in software over time (software evolution, software archaeology)

☐ Understanding software structure (program comprehension)

☐ Understanding software execution (program comprehension)

☐ How software is developed (social aspects of software engineering)

☐ How software is used (usage patterns, understanding end users)

☐ The study does not focus on software engineering problems

☐ Other: ....

10. **How companies have been involved to the study?** *
   If no company involvement is specified answer "-".

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Data and Metrics

11. **Does the paper introduce new visualization method?** *
   New visualization or layout algorithm, new visualization metaphora or novel rendering technique, etc.
   Mark only one oval.

   ( ) Yes

   ( ) No

12. **Does the paper introduce new visualization tool?** *
   Tool or framework to create different kind of (well known or new) visualizations.
   Mark only one oval.

   ( ) Yes

   ( ) No

13. **What data is visualized?** *
   List the data sources used for visualization. If no visualizations is presented answer "No visualizations presented". If the question is not relevant in the scope of the article, even if it presents visualizations, answer "Not relevant" and explain to next question why the the question is irrelevant.
   Check all that apply.

   [ ] Sourcecode

   [ ] Software execution data (trace logs, function call data, etc.)

   [ ] Static code analysis data provided by compiler, debugger, analyzer

   [ ] Version control system data (e.g. commit data)

   [ ] Issue management (bug tracker) data

   [ ] Requirements documents

   [ ] No visualization presented

   [ ] Not relevant (Please, specify the reasons of why this is irrelevant in next question)

   [ ] Other: ....

14. **Why data used in visualizations is not described in the article?**

Answer only if you answered "Not relevant" for the last question.

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15. **What attributes and metrics are visualized from the data?** *

In the visualization it is common to present metrics calculated from the original data instead of the raw data. List here all metrics visualized (if the text doesn't describe the metrics well try to check out what attributes of the data are mapped to visualization). Some commonly used OO metrics are also listed here: http://agile.csc.ncsu.edu/SEMaterials/OOMetrics.htm . If no visualization is presented answer "No visualization presented". If the metrics are not relevant for the article even if it presents visualizations, answer "Not relevant" and explain to next question why this question is irrelevant in the scope of the article.
Check all that apply.

- [ ] Number of classes
- [ ] Number of methods
- [ ] Lines of code
- [ ] Coupling factor ("the measure of the strength of association established by a connection from one module to another")
- [ ] Cohesion ("how closely the operations in a class are related to each other")
- [ ] Method hiding factor (encapsulation)
- [ ] Attribute hiding factor (encapsulation)
- [ ] Number of children (inheritance)
- [ ] Depth of inheritance tree (inheritance)
- [ ] Code complexity
- [ ] Amount of commits
- [ ] Amount of issues / bugreports
- [ ] Time (e.g. time of a commit)
- [ ] Duration (e.g. duration of function call, test run, etc.)
- [ ] Hierarchies (e.g. class hierarchy, file system hierarchy, etc.)
- [ ] Geo-spatial information (e.g. geographic positions of developers)
- [ ] No visualization presented
- [ ] Not relevant (Please, specify the reasons of why this is irrelevant in next question)
- [ ] Other: ....

16. **Why metrics visualized is not described in the article?**
Answer only if you answered "Not relevant" for the last question.

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Visualizations

17. **Does the visualization use multiple views? ***
Mark only one oval.

○ Yes

○ No

○ Not relevant

18. **What visualization paradigms are used? ***
Info graphics = Common information graphics used to represent 2D-data. As an example line-, bar- and pie charts. Timelines = Visualizations used for temporal data. Data Maps = Visualizations used for geo-spatial data. Pixel-oriented techniques = Value of a data element is mapped to a pixel (dense pixel displays). The interesting part is the different possibilities of organizing the pixels. Geometric projection techniques = Visualization technique for multidimensional and multi variate data that tries to find the interesting parts from the data using different geometric projections. E.g. scatter plot matrices, conditional plots, projection pursuit, parallel coordinates, hyperbox and hyperslice. Icon-based techniques / Icon displays = Each (multidimensional) data element is mapped to some graphical element -- an icon. E.g. stick visualizations. Hierarchical and Graph-Based Techniques = Different kind of visual presentations for relational and hierarchical data. For more detailed descriptions check this:
http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=553159
Check all that apply.

☐ Info graphics (1D- and 2D-data)

☐ Timelines (Temporal data)

☐ Data maps (Geo-spatial data)

☐ Hierarchical and Graph-Based Techniques (>2D-data)

☐ Icon-based techniques / Icon displays (>2D-data)

☐ Geometric projection techniques (>2D-data)

☐ Pixel-oriented techniques (>2D-data)

☐ Not stated clearly in the article

☐ No visualizations are presented

☐ Other: ....

19. **What visual attributes are used in the visualizations?** *

Data elements can be connected to different visual attributes as color, shape and motion to make visualization more effective. Different attributes works well with different visualization paradigms. Select all parameters applied!
Check all that apply.

- [ ] Spatial location
- [ ] Color / texture
- [ ] Size / area
- [ ] Spatial orientation
- [ ] Shape
- [ ] Motion / animation
- [ ] Not stated clearly in the article
- [ ] No visualizations are presented
- [ ] Other: ....

Evaluation of Visualizations

20. **What aspects of the visualizations/tools has been evaluated?** *

Four first options concerns understanding the data analysis and the three latter options consider understanding the visualizations. More about the categories presented can be red here: http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=6095544
Check all that apply.

- [ ] Understanding environments and work practices (data analysis)
- [ ] Evaluating visual data analysis and reasoning (data analysis)
- [ ] Evaluating communication through visualization (data analysis)
- [ ] Evaluating collaborative data analysis (data analysis)
- [ ] Evaluating user performance (visualization)
- [ ] Evaluating user experience (visualization)
- [ ] Evaluating visualization algorithms (visualization)
- [ ] Validating functionality of a visualization tool/method
- [ ] No evaluation is presented
- [ ] Not relevant (Please, specify the reasons of why this is irrelevant in the end of the section)
- [ ] Other: ....

21. **How are visualizations/tools evaluated?** *

Check all that apply.

☐ Based on theories or literature

☐ Controlled experiment (user study)

☐ Case study (user study)

☐ Based on fieldstudy

☐ Based on scenarios

☐ Based on simulations

☐ Based on informal experimentation and testing

☐ No evaluation is presented

☐ Not relevant (Please, specify the reasons of why this is irrelevant in the end of the section)

☐ Other: ....

22. **Why evaluating visualizations is not relevant in this article?**

Answer only if you answered "Not relevant" for the last questions.

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Other

Notes and comments regarding the paper. Especially if you are unsure about some of your answers report it here.

23. **Reviewer notes**

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