## Global Illumination for Fun and Profit

Josiah S. Carberry 🗓, Ed Grimley, and Martha Stewart

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Index Terms - Radiosity, global illumination, constant time

### 1 Introduction

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### 3 HYPERLINKS AND CROSS REFERENCES

Here are examples for use within a sentence: Fig. 2, Tab. 1, Secs. 6 and 7, Eq. (1). The following sentences all start with a reference: Figure 2 is a figure environment. Table 1 is a table environment. Sections 6 and 7 are section environments. Equation (1) is an equation environment.

### 3.1 Subsection Two

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### 4 FIGURES

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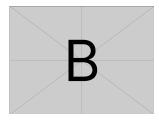
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### 4.1 Subfigures

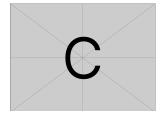
See Fig.1 for an example.





(a) The letter A.

(b) The letter B.



(c) The letter C.

Fig. 1. Example of adding subfigures.

### 5 EQUATIONS AND TABLES

Equations can be added like so:

$$\sum x - \int_{0}^{1} f \tag{1}$$

Tables, such as Tab. 1 can also be included.

Table 1. Vis Paper Acceptance Rate

Year	Submitted	Accepted	Accepted (%)
1994	91	41	45.1
1995	102	41	40.2
1996	101	43	42.6
1997	117	44	37.6
1998	118	50	42.4
1999	129	47	36.4
2000	151	52	34.4
2001	152	51	33.6
2002	172	58	33.7
2003	192	63	32.8
2004	167	46	27.6
2005	268	88	32.8
2006	228	63	27.6
2007	216	56	25.9
2008	197	50	25.4

### 6 SUPPLEMENTAL MATERIAL INSTRUCTIONS

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Research should be transparent, reproducible, and trustworthy. Authors should be as transparent as possible about their research process. Increased transparency can help reviewers and readers judge for themselves whether the research conducted was plausible and whether the results are reliable. In particular, research should be:

- Transparent—enough description and supplemental material should be provided so that reviewers and readers can follow all important details of any processes or analyses.
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Research should be replicable and transferable. We believe that our community should support knowledge transfer between teams and that research results should stand up to scrutiny by future researchers. An independent team should be able to replicate or transfer the research results in other contexts, locations, domains, and in multiple trials. By making research more transparent and reproducible, we make it easier for future researchers to adopt and adapt the research methodologies to new situations as well as larger or otherwise more convincing studies.

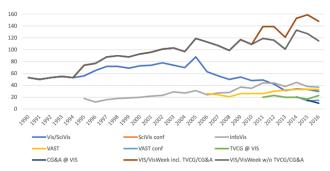


Fig. 2. visualization of the 1990–2016 vis paper acceptance data, recreated based on Fig. 1 from [1].

### 6.1 Where to upload supplemental material

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### 7 REFERENCES

### 7.1 Include DOIs

All references which have a DOI. The DOI can be entered with or without the https://doi.org/prefix.

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  Within each set of multiple references, the references should be sorted in ascending order.
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  - o volume
  - o number
  - o month of publication as variable name (i.e., Jan for January, etc.; month ranges using Jan / Feb or Jan Feb)
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corporation—Starbucks Research—and there is no feasible way to share it publicly.

### FIGURE CREDITS

Figure 2 is a partial recreation of Fig. 1 from [1], which is in the public domain.

### **ACKNOWLEDGMENTS**

The authors wish to thank A, B, C. This work was supported in part by a grant from XYZ.

#### REFERENCES

- [1] P. Isenberg, F. Heimerl, S. Koch, T. Isenberg, P. Xu, C. Stolper, M. Sedlmair, J. Chen, T. Möller, and J. Stasko. vispubdata.org: A Metadata Collection about IEEE Visualization (VIS) Publications. IEEE Transactions on Visualization and Computer Graphics, 23, 2017. doi: 10.1109/TVCG.2016.2615308
- [2] Kitware, Inc. The Visualization Toolkit User's Guide, January 2003.
- [3] W. E. Lorensen and H. E. Cline. Marching cubes: A high resolution 3D surface construction algorithm. SIGGRAPH Computer Graphics, 21(4):163–169, Aug. 1987. doi: 10.1145/37402.37422
- [4] N. Max. Optical models for direct volume rendering. IEEE Transactions on Visualization and Computer Graphics, 1(2):99–108, June 1995. doi: 10.1109/2945.468400

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