



The State of Reproducibility Stamps for Visualization Research Papers

Tobias Isenberg

Inria

Motivation

- “A scientific result is not truly established until it is independently confirmed.” [Boisvert, 2016]

- we need code & data  GitHub  GitLab  OSF

- code & data not enough

- is it documented? does it run?

[Bonneel et al., 2020]

- does it produce the promised results?

- Graphics Replicability Stamp Initiative

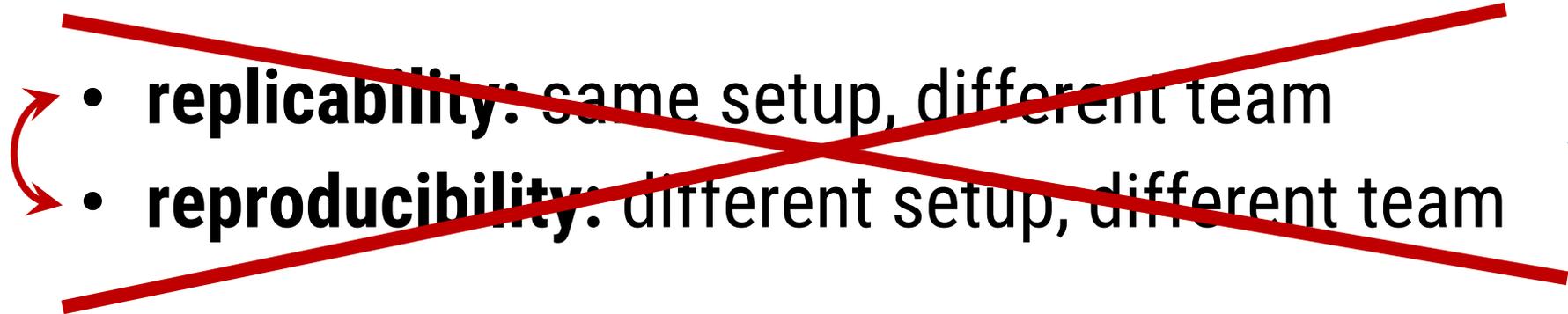
replicabilitystamp.org



Terminology

- **reproducibility**: same setup, different team
- **replicability**: different setup, different team

[Claerbout and
Karrenbach, 1992]

- 
- ~~• **replicability**: same setup, different team~~
 - ~~• **reproducibility**: different setup, different team~~



- **reproducibility**: same setup, different team
- **replicability**: different setup, different team



Data Collection



Graphics Replicability Stamp Initiative

An additional recognition for authors who are willing to go one step further, and in addition to publishing the paper, provide a complete open-source implementation.

[Mission](#) [Replicable Papers](#) [Organization](#) [News](#)

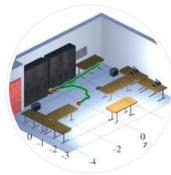
Replicable Papers

Adaptive Complementary Filter for Hybrid Inside-Out Outside-In HMD Tracking with Smooth Transitions

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Repository

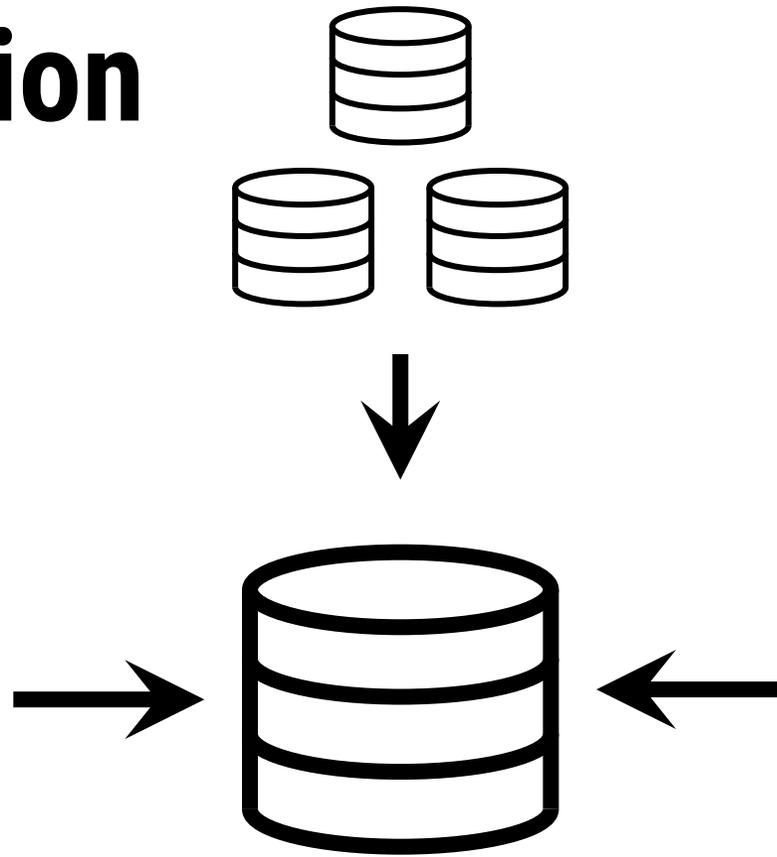


A Testbed for Studying Cybersickness and its Mitigation in Immersive Virtual Reality

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Repository



IEEE Xplore[®]
Digital Library



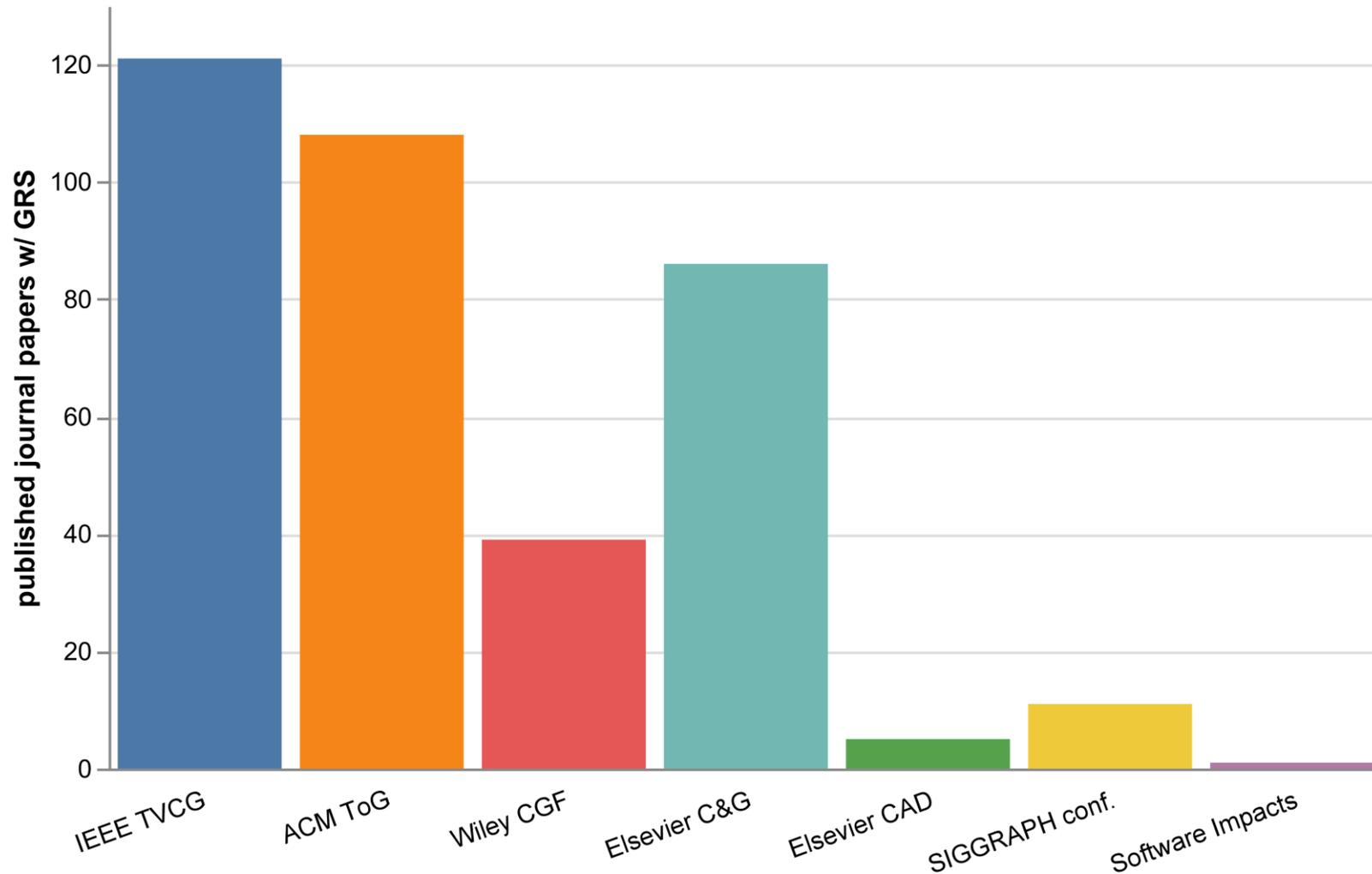
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vispubdata.org



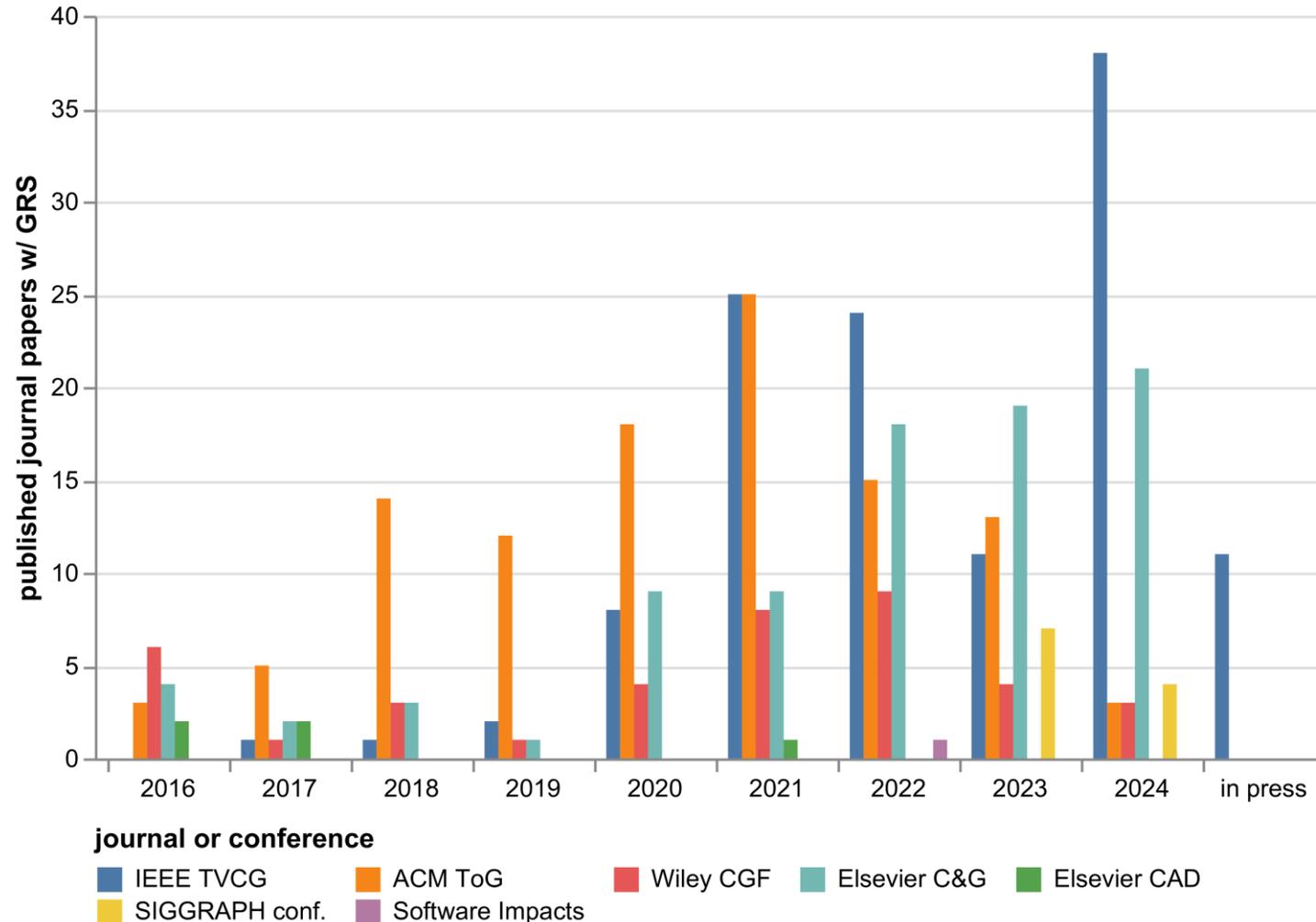
GRSI-certified papers by journal*



* in 2024 SIGGRAPH conference papers were added as a venue

(data and plots current as of today)

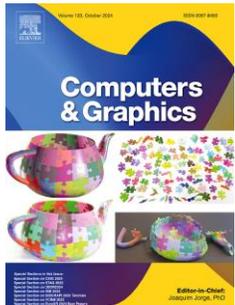
GRSI-certified papers by year



Visualization or not?

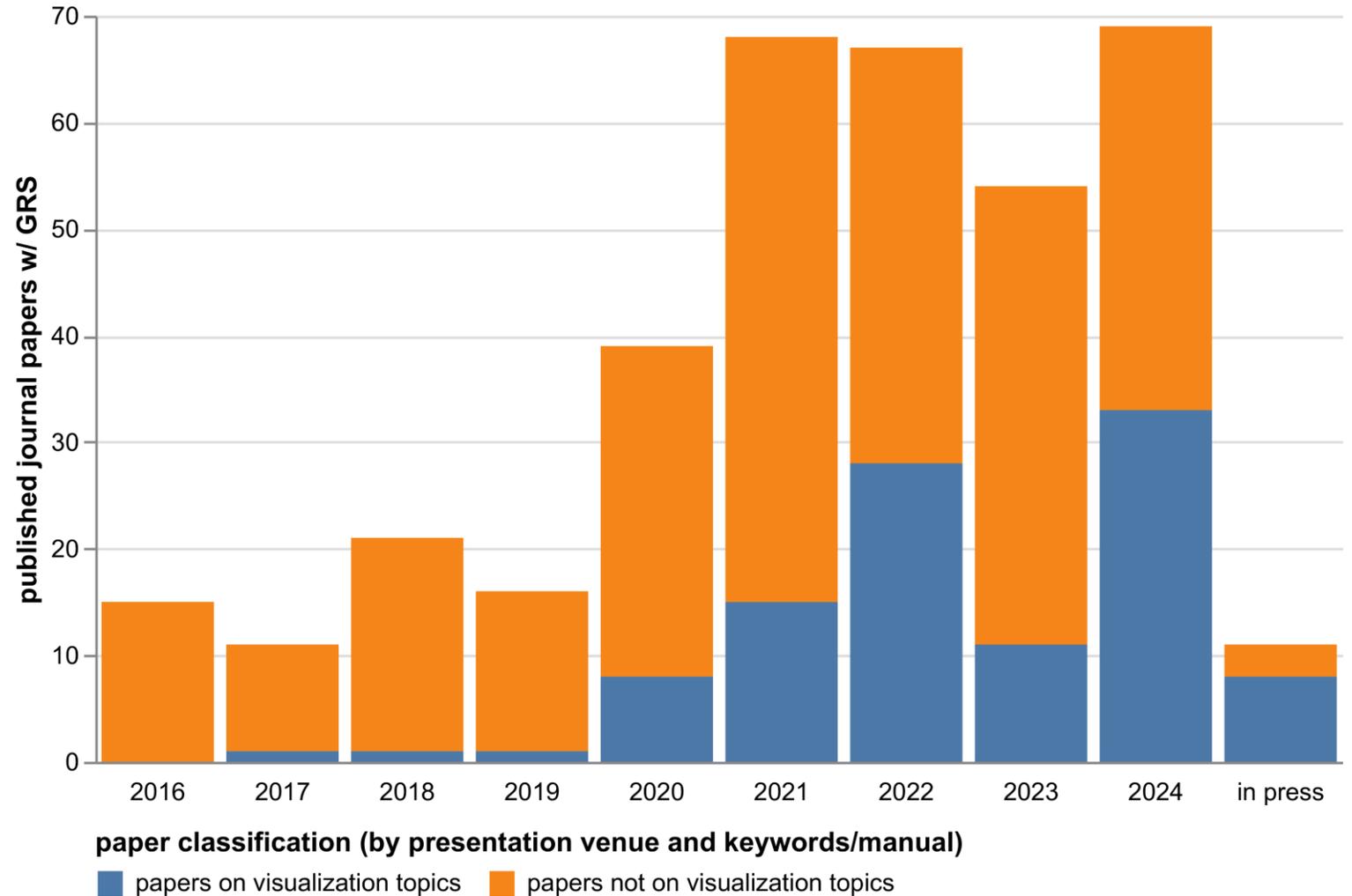


PACIFIC VIS

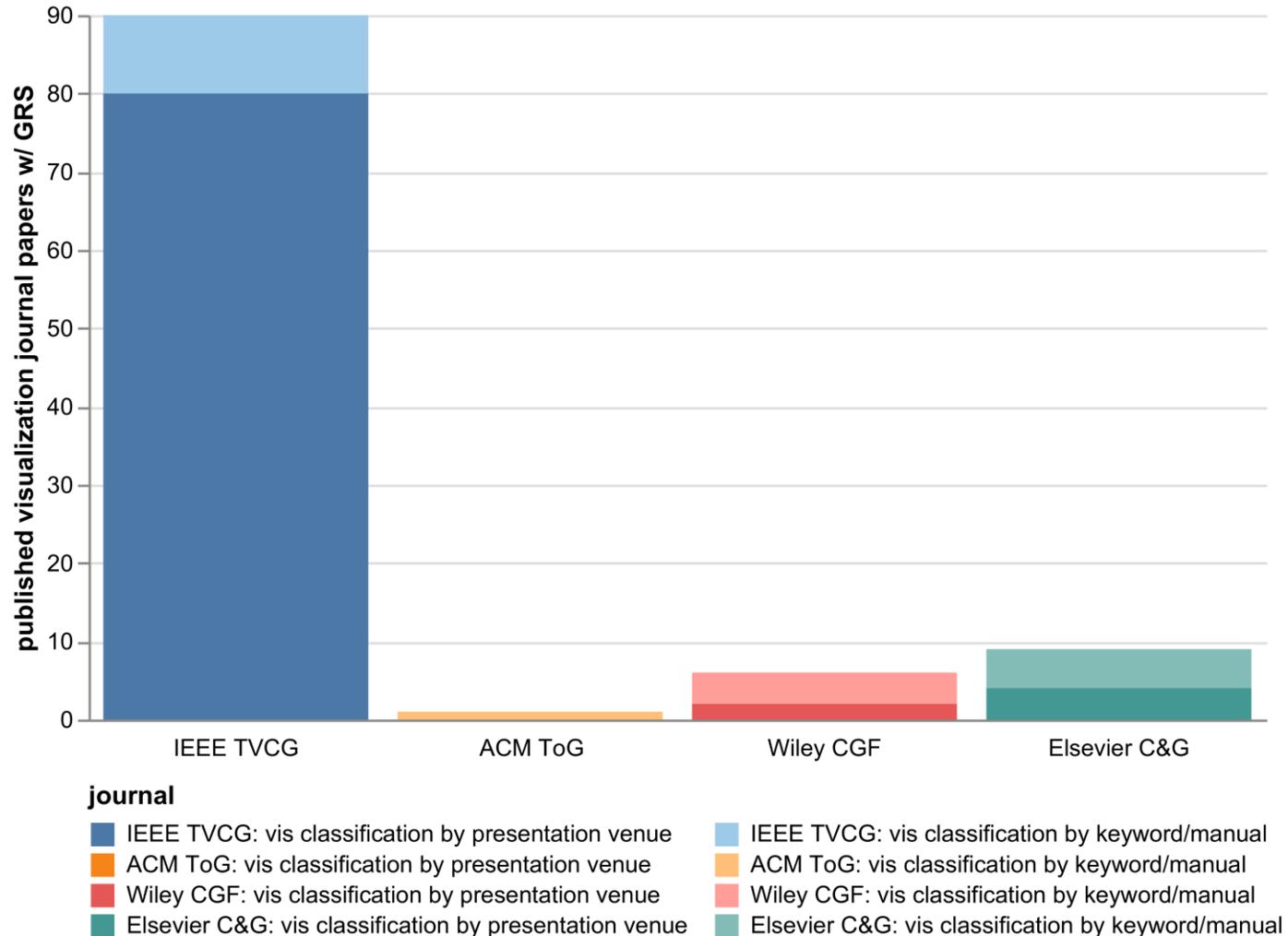


**MolVA EuroVA
EnvirVis**

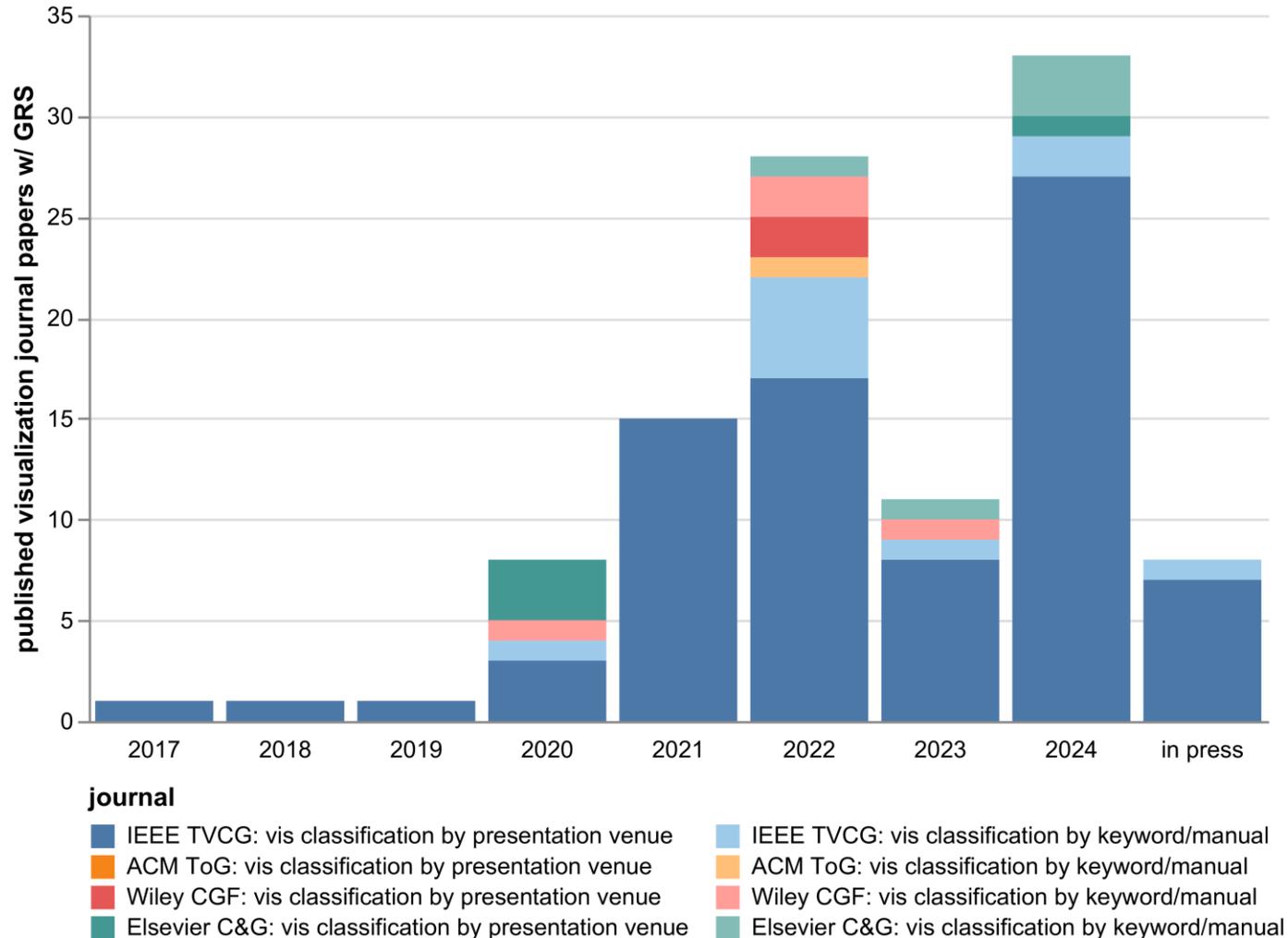
+ keywords (10.4%) + manual (8.5%)



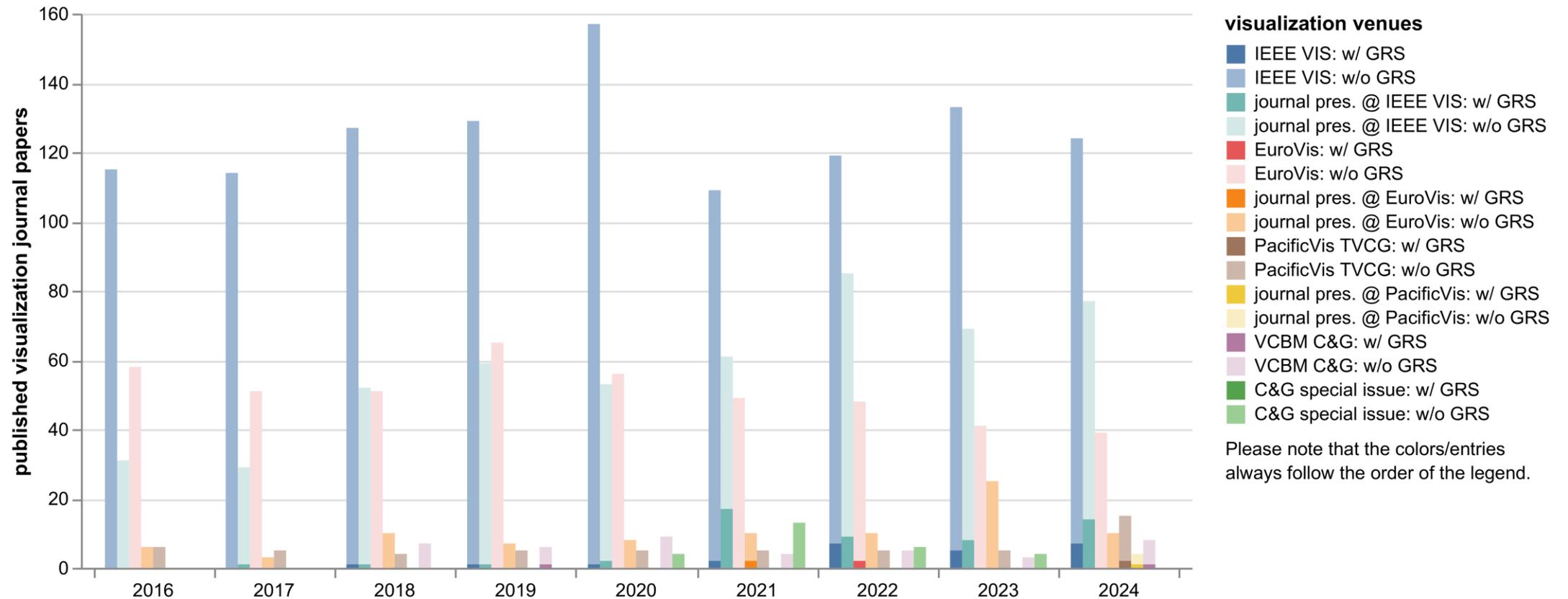
Where do VIS GRSI papers come from?



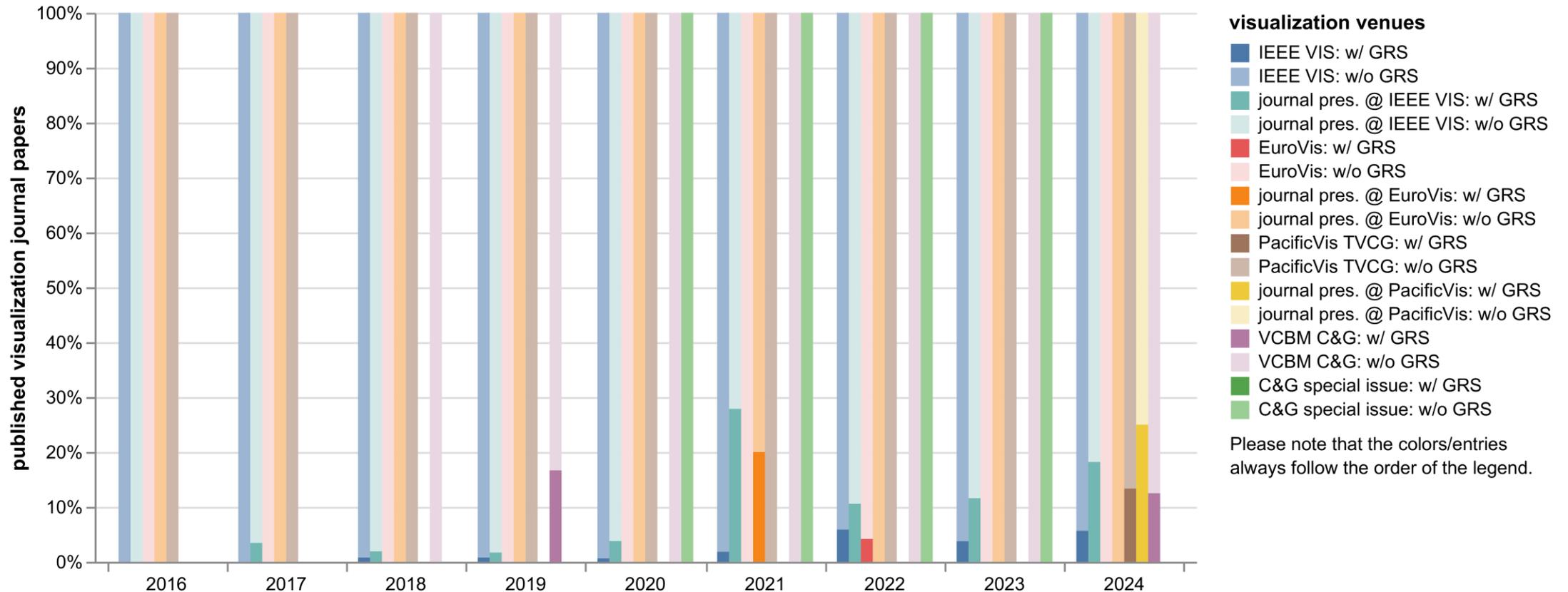
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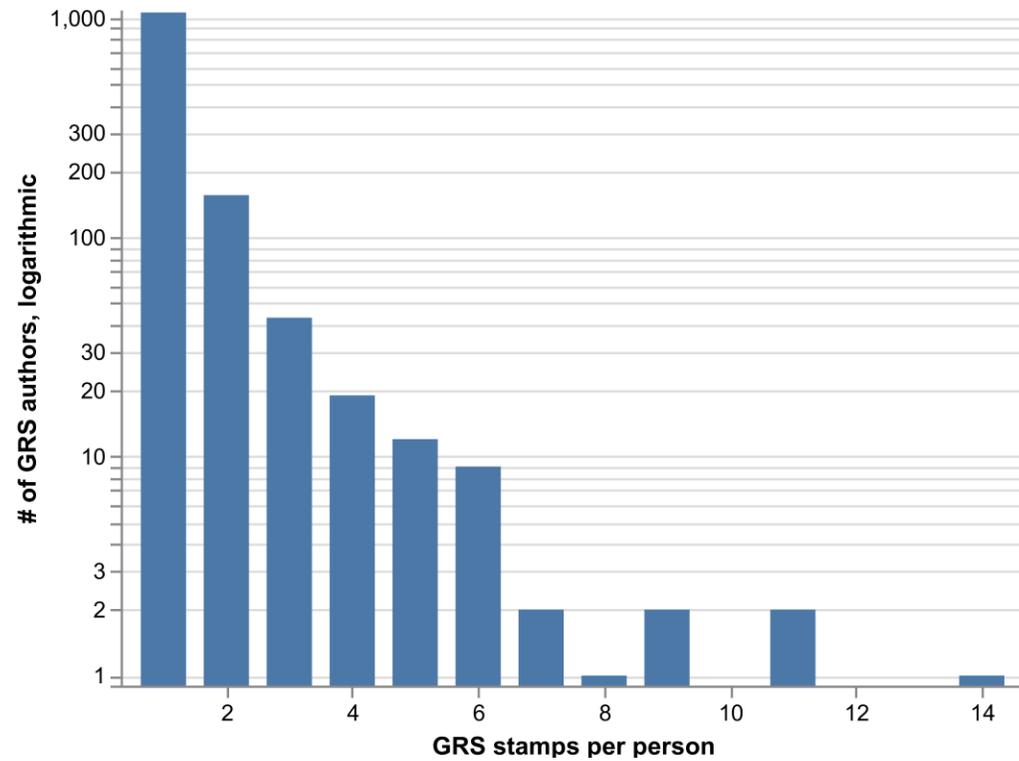
VIS GRSI contributions by presentation venue



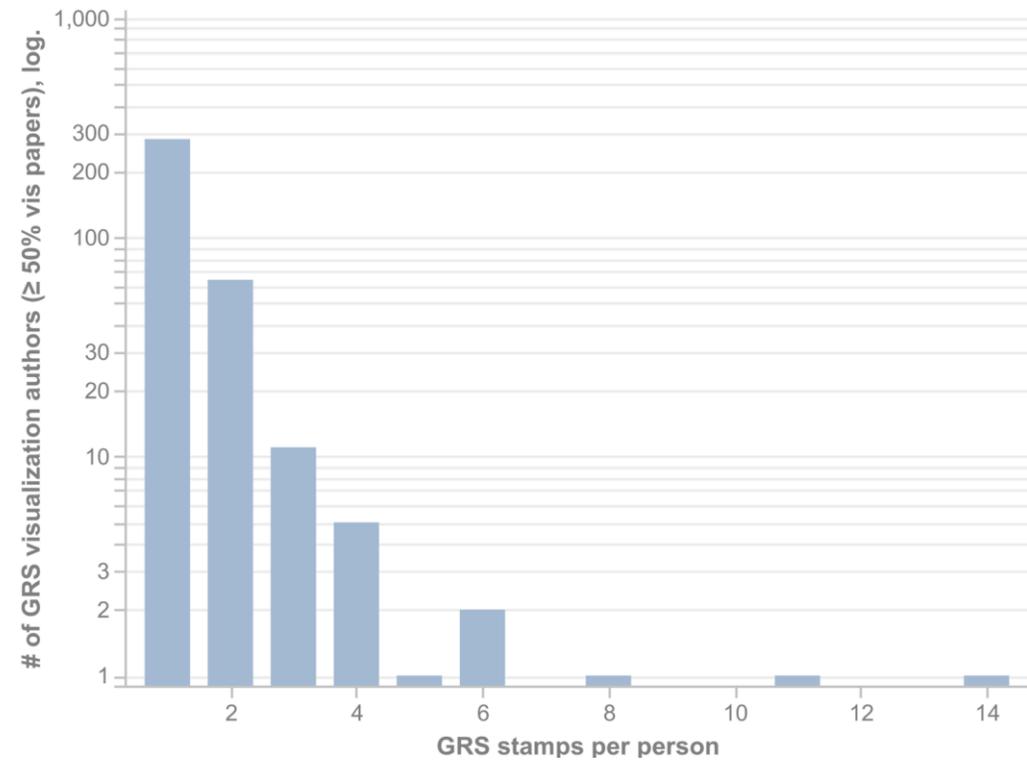
VIS GRSI proportions by presentation venue



of GRSI stamps per author

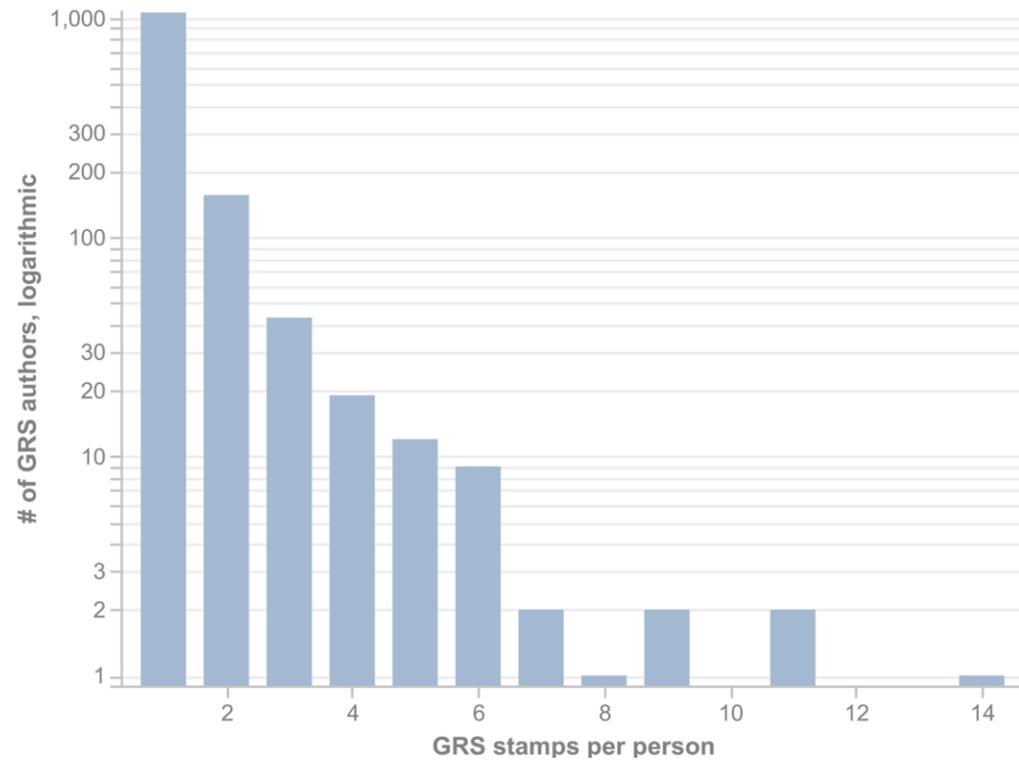


all GRSI authors

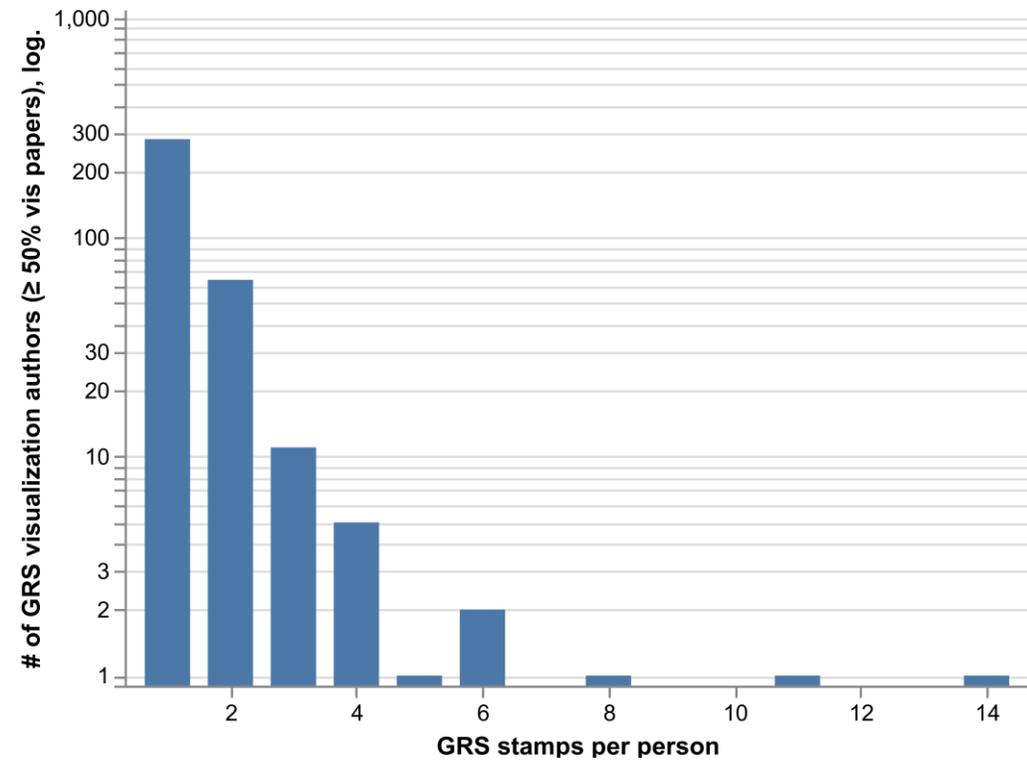


VIS-only GRSI authors

of GRSI stamps per author

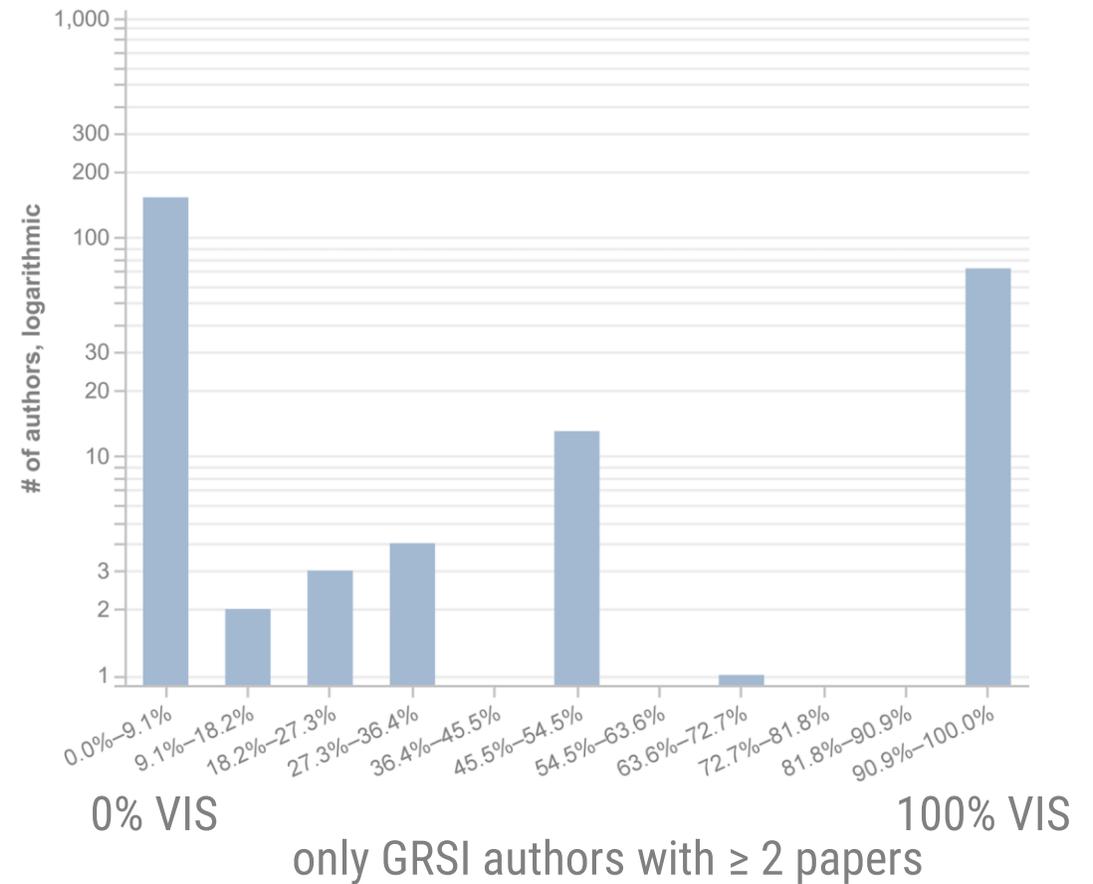
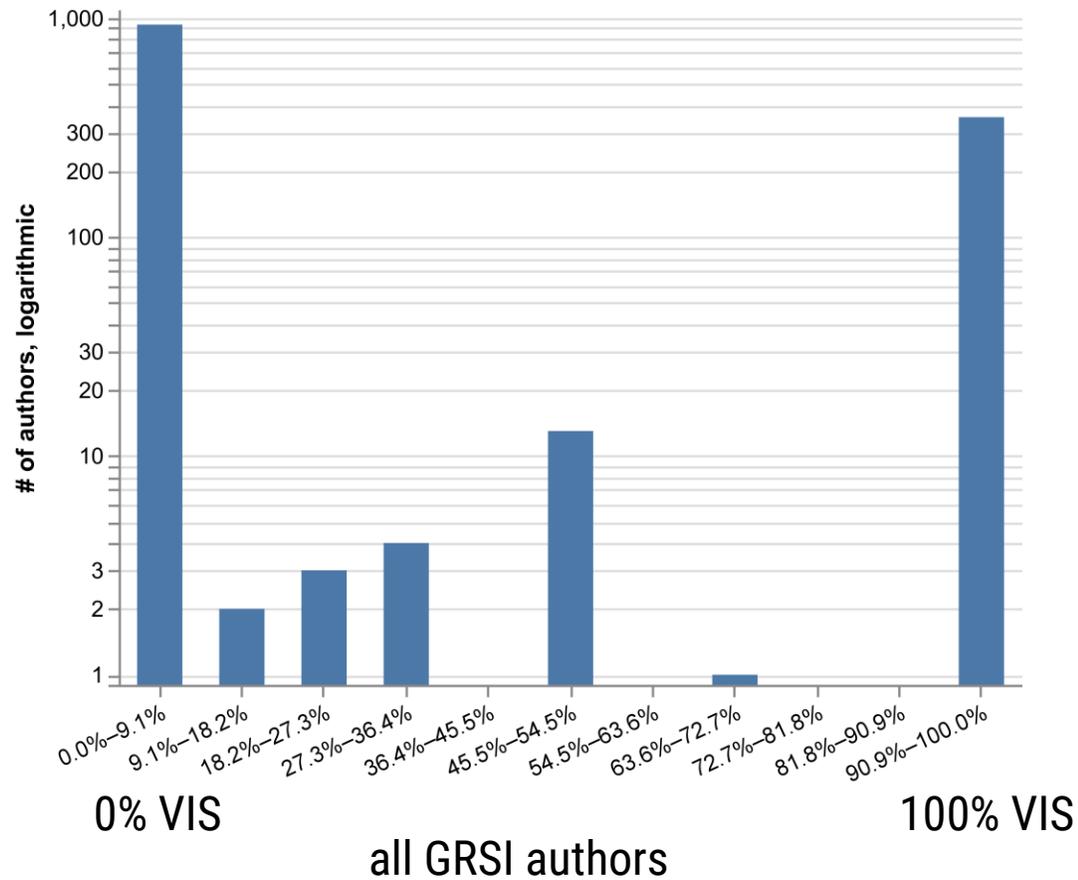


all GRSI authors

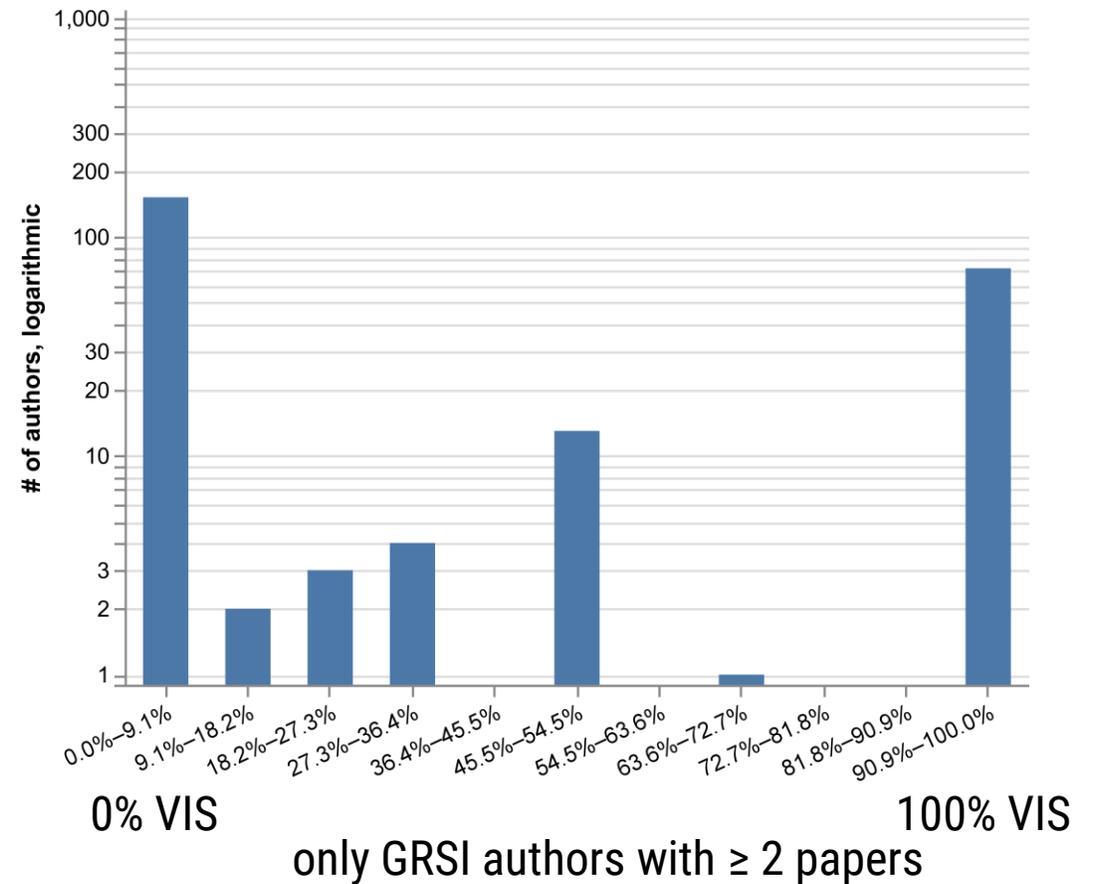
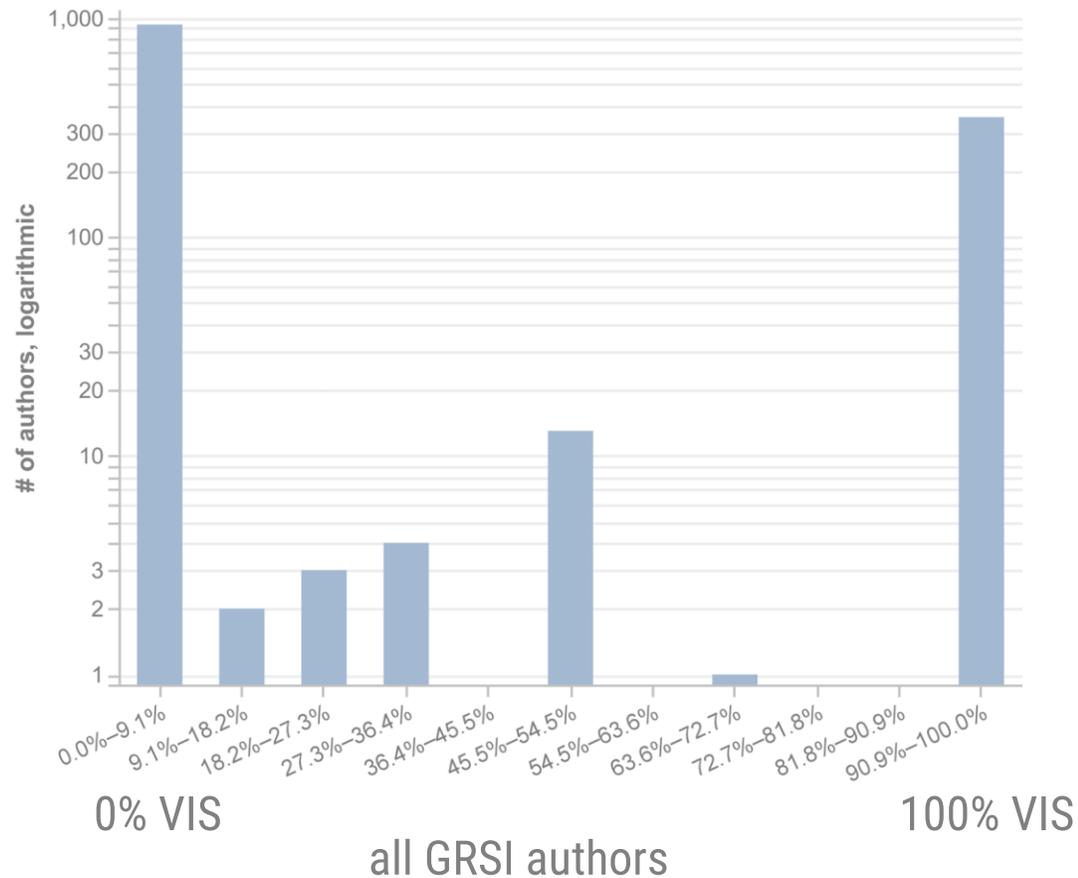


VIS-only GRSI authors

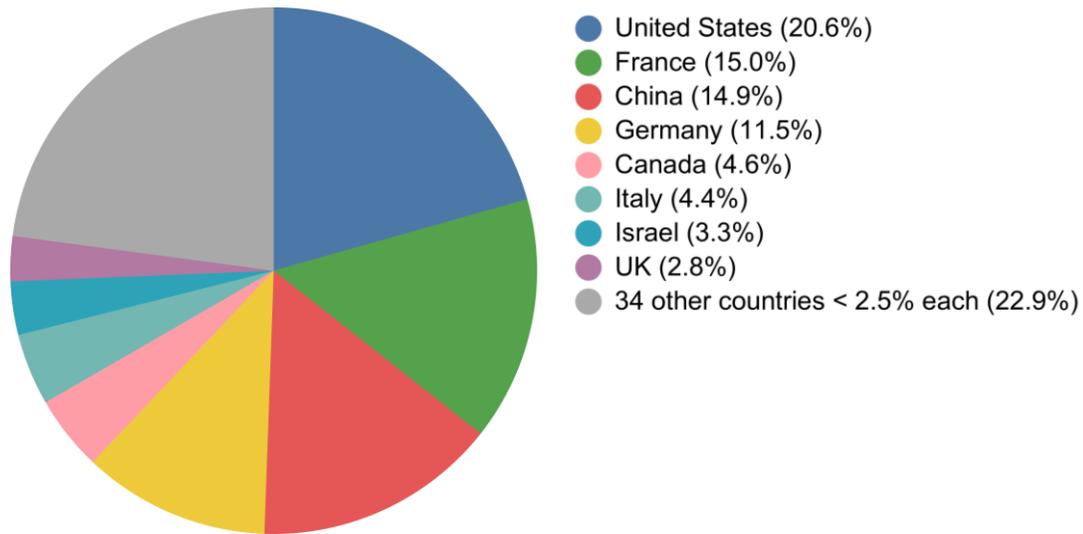
Author split between VIS and not VIS



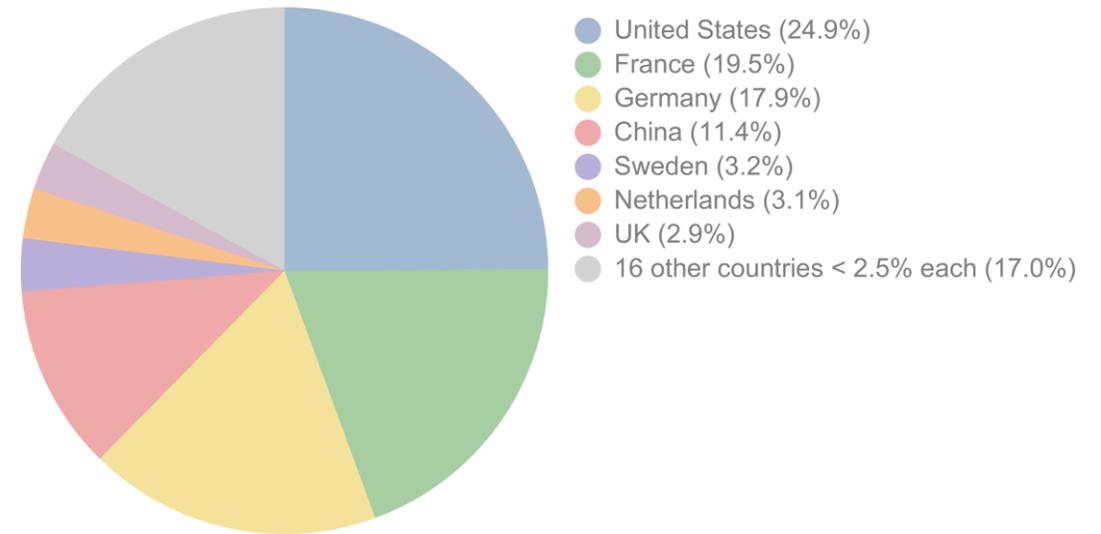
Author split between VIS and not VIS



Contributions by country

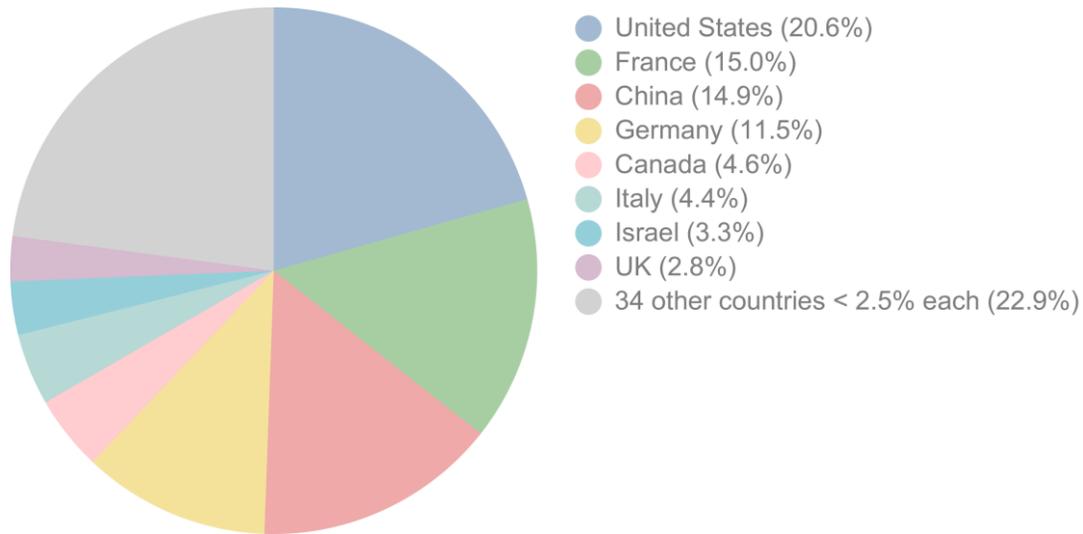


all GRSI-awarded papers

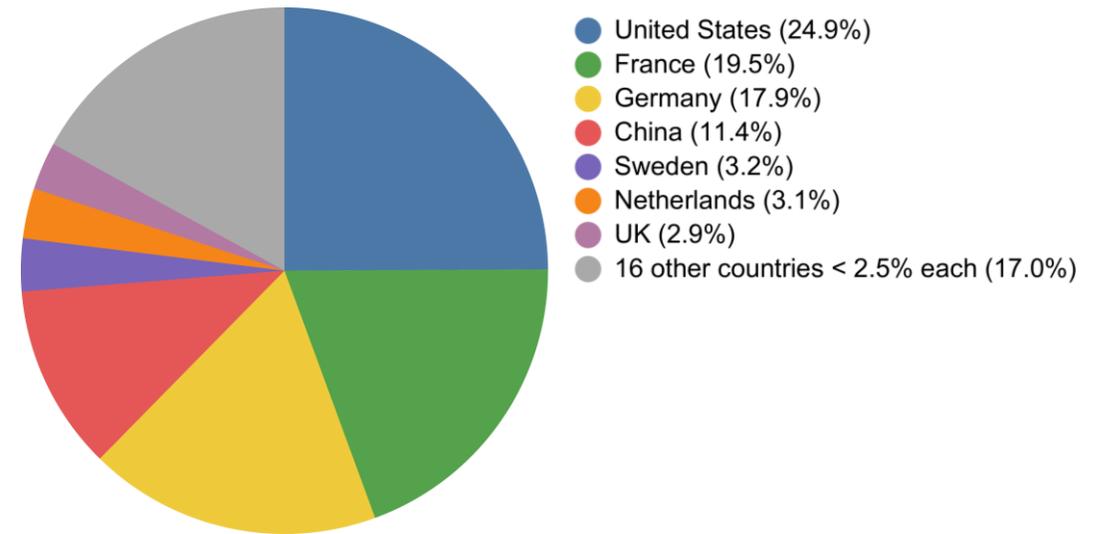


VIS-only GRSI-awarded papers

Contributions by country



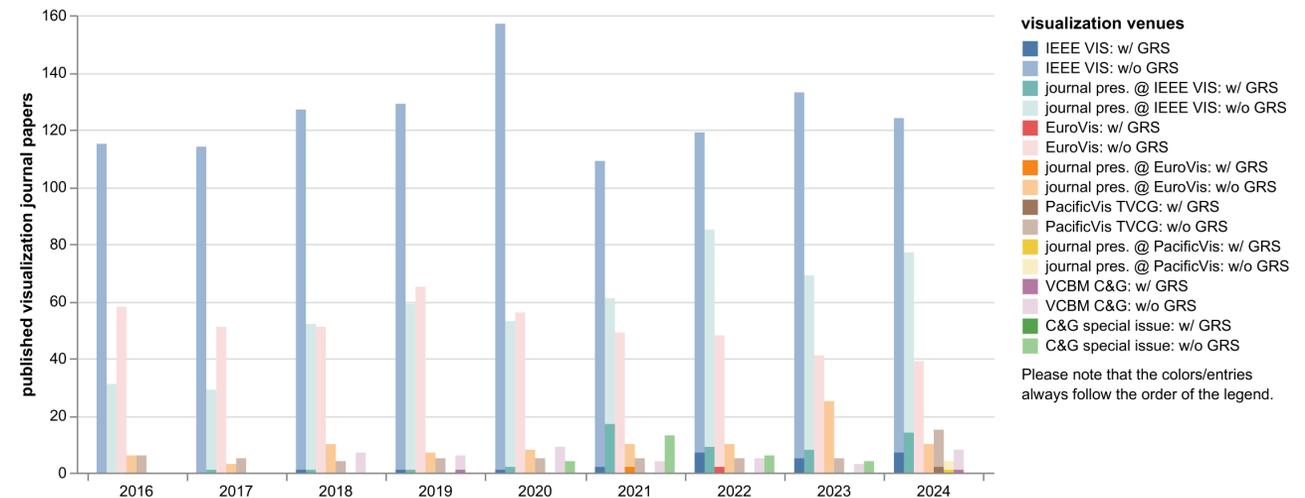
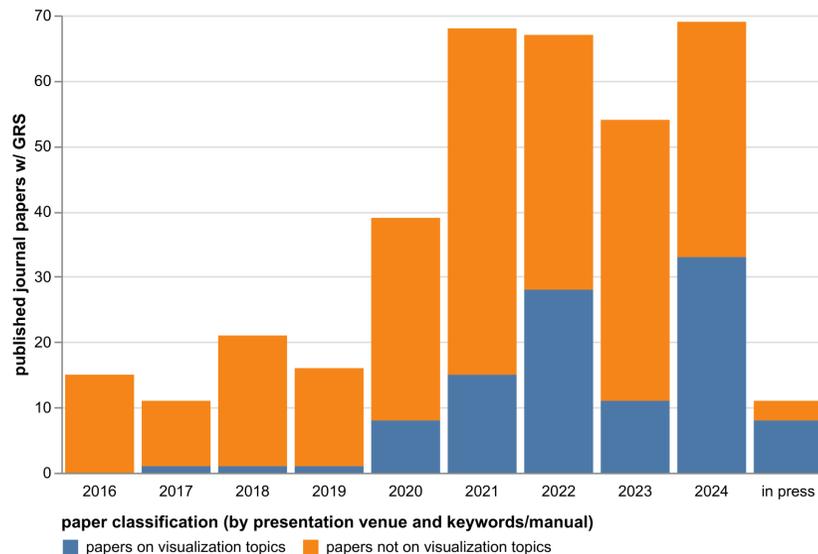
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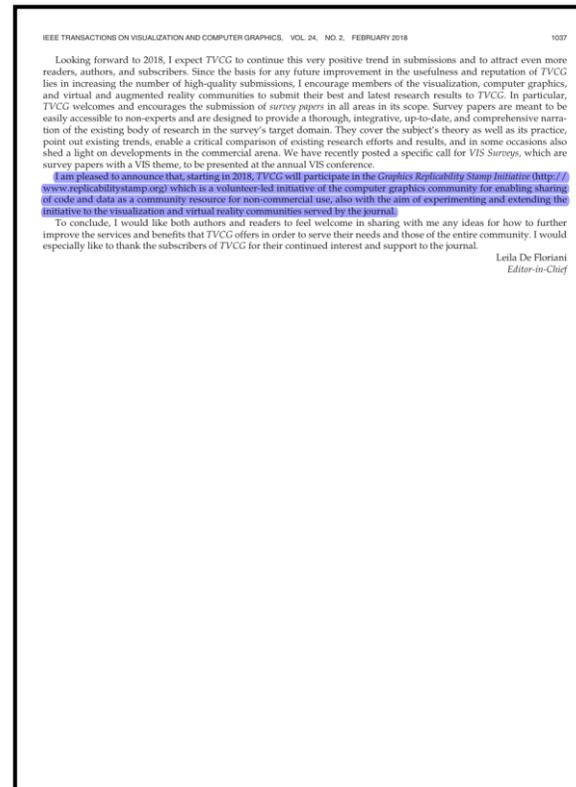
Discussion

- numbers are increasing, but still low
 - 28.6% of GRSI papers are from VIS (106 out of 371)
 - from all full IEEE VIS papers 2021–24: only 21 or 4.3% have a GRS
 - for TVCG presentations @ VIS 2021–24: 48 or 19.8% have a GRS



Possible reasons

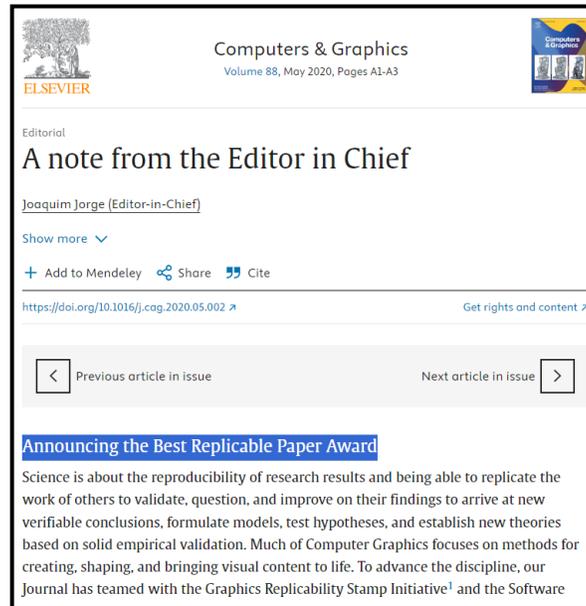
- GRSI not well enough known among authors
→ need to advertise better; but things are improving



2020: 1 paper, 0.6%
2021: 2 papers, 1.8%
2022: 7 papers, 5.9%
2023: 5 papers, 3.8%
2024: 7 papers, 5.6%

Possible reasons

- GRSI not well enough known among authors
→ need to advertise better; but things are improving
- lack of incentives, extra work, only eternal fame and glory
→ more incentives (awards?); but GRSI helps you, too!

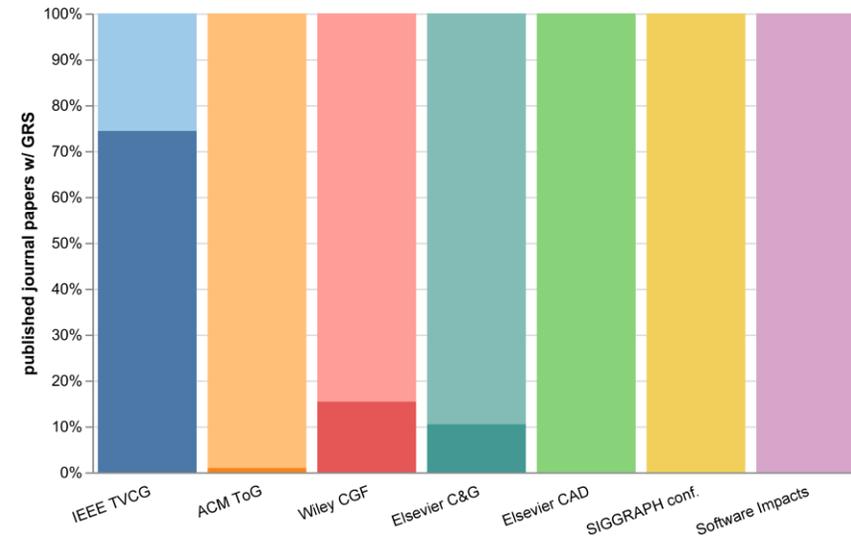


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- VIS underrepresented in possible GRSI venues
→ can we change that?



(Zoom) meetup: Thursday, Oct 17,
3:15pm Tampa, 21:15 Europe



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- some work inherently difficult to reproduce (special HW)
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- commercialization intents/proprietary code

Reproducible paper writing



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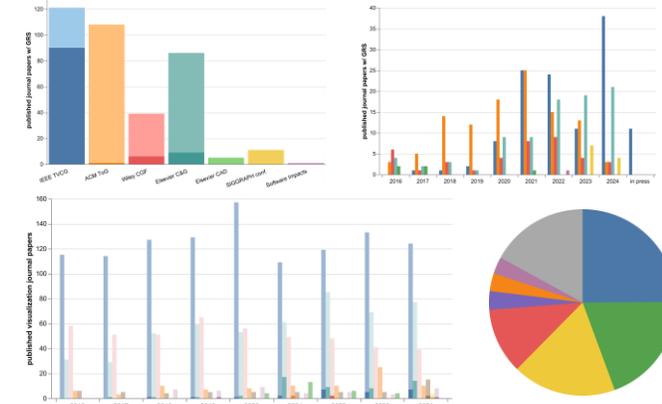


Repository



```

1 #!/usr/bin/python
2
3 from urllib.request import urlopen
4 from bs4 import BeautifulSoup
5 import re
6 import os,sys
7 import cv
8 import datetime
9 import json
10 import pandas as pd
11 import altair as alt
12 import time # to be able to wait if the calls are limited somehow
13 from colorsys import rgb_to_hls, hls_to_rgb
14 from math import nan
15 import math
16 import glob
17 import shutil
18
19 # settings of how to do things and what extra stuff to do
20 useLocalDataOnly = False #FIXME: should be True for submission
21 exportVisualizations = True
22 doNameChecking = False
23 doAbstractCheckingOfKeywords = False
24 doVerifyCountryInformation = True
25 doPrintTVCGinPressDetails = False
26 doExportNumbersOfPaper = True
27 doCopyListAccordingToPaperNumbers = True
28 downloadCafFromCrossref = True # if True, then use the Crossref API to get ACM metadata, otherwise the acmdlload tool; FIXME: should
29
30 # other configuration
31 visPadding = 8 # the padding in pixels to be applied to the exported visualizations, set to 0 for use in paper, otherwise 8 is good
32 makeMainPieChartsComparable = True # if the main pie charts should use a single color scale such that each country always has the
33 graphOutputSubdirectory = "graphs/"
34 paperFiguresOutputSubdirectory = "paper_figures/"
35 dataOutputSubdirectory = "publication_data"
36 paperNumbersOutputFile = "paper/numbersFromScript.tex"
37 paperNumbersOutputString = ""
38 paperKeywordPapersOutputFile = "paper/keywordPapersFromScript.tex"
39 paperKeywordPapersOutputString = ""
40 numbersOfAuthorsInFiguresAxis = 11
41 countryPieChartThreshold = 2.5 # in percent (1-100)
42 neutralGray = "#808080"
43 paperNumberOutputString += "\newcommand{\GrsiCountryPieChartThreshold}[1]{\str(countryPieChartThreshold) + "%}in"
44 # change to directory of the script
45 # makeMainPieChartsComparable = True # if the main pie charts should use a single color scale such that each country always has the
46
47 #####
48 #####
49 #####
50 pathOfTheScript = os.path.dirname(sys.argv[0])
51 if pathOfTheScript != "": os.chdir(pathOfTheScript)
52
53 #####
54 # create some output directories if they do not exist yet
55 #####
56 if (graphOutputSubdirectory != "") and not (os.path.isdir(graphOutputSubdirectory)):
57     os.mkdir(graphOutputSubdirectory)
58 if (doCopyPlotAccordingToFigureNumbers) and (paperFiguresOutputSubdirectory != "") and not (os.path.isdir(paperFiguresOutputSubdirec
59     os.mkdir(paperFiguresOutputSubdirectory)
60 if (dataOutputSubdirectory != "") and not (os.path.isdir(dataOutputSubdirectory)):
61     os.mkdir(dataOutputSubdirectory)
62
63 #####
64 # pre-load some data to avoid loading it multiple times
65 #####
66 vegaPaletteData = {}
67 with open("palettes.js", "r") as file:
68     for line in file:
69         if not line:
70             continue
71         lineData = line.split(":")
72         label = lineData[0].strip()
73         colorDataString = lineData[1].replace(" ", "").replace(", ", "").strip()
74         colorDataArray = ["#" + colorDataString[i:i+6] for i in range(0, len(colorDataString), 6)]
75         vegaPaletteData[label] = colorDataArray
76 #####
  
```



```

65 \newcommand{\GrsiIeeeVisPapersInMXXIV}{7}
66 \newcommand{\GrsiIeeeVisJournalPresentationsCount}{53}
67 \newcommand{\GrsiIeeeVisJournalPresentationsLastYear}{2024}
68 \newcommand{\GrsiIeeeVisTVCGJournalPapersInMXXVII}{1}
69 \newcommand{\GrsiIeeeVisTVCGJournalPapersInMXXVIII}{1}
70 \newcommand{\GrsiIeeeVisTVCGJournalPapersInMXXIX}{1}
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87 \newcommand{\GrsiCagSpecialIssuesPapersCount}{0}
88 \newcommand{\GrsiCagSpecialIssuesPapersLastYear}{2023}
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90 \newcommand{\GrsiVisManuallyMarkedPapersCount}{9}
91 \newcommand{\GrsiVisKeywordPlusManualPapersCount}{20}
92 \newcommand{\GrsiTotalVisPapers}{106}
93 \newcommand{\GrsiVisKeywordPlusManualPapersPercentage}{18.9}
94 \newcommand{\GrsiPercentageVisPapers}{28.6}
  
```



Paper, data, code, more information

-  **GitHub** repo: [tobiasisenberg/Visualization-Reproducibility](https://github.com/tobiasisenberg/Visualization-Reproducibility)
- URL: tobias.isenberg.cc/p/Isenberg2024SRS

- to fully reproduce:
 -  python™ (data frozen from final paper time)
 - then L^AT_EX
- to get updated data:
GitHub documentation



thanks:

- GRSI organizers/reviewers
- data providers (vispubdata, Stefanie Behnke, Ross Maciejewski, Lane Harrison, VIS 2024 papers chairs)
- repository feedback: Cody Dunne
- reviewer & arXiv feedback