EVALUATING COMPUTER SCIENCE: CHALLENGES AND SOLUTIONS

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OUTLINE

UH research assessment, past & current

How to assess Computer Science?

Bibliographic data collection

Hindsights based on the RA materials

UNIVERSITY OF HELSINKI ASSESSMENT TIMELIME, BIBLIOMETRIC POV

Year	Bibliometrics	Notes
1999	None	CRIS exists, but not useful enough
2005	Top papers selected by the unit Publication lists	Last time papers were actually read by the panelists?
2010-2012	Publications harvested from CRIS Publication lists CWTS analysis Additional analyses by the library	Pure CRIS acquired Heavy use of all available metrics Library has a role in the process
2014	Same as above, except for publication lists	Follow-up for publications only
2019	Publications harvested from CRIS CWTS analysis Additional analyses by the library	More careful use of metrics No CWTS analysis for some units Library plays a central role

HOW DO YOU FIT COMPUTER SCIENCE INTO THIS?

2005	**Role of conferences** is stated: "Department research is published in the highest quality international journals as well as presented at top ranked international conferences. <mark>Indeed, high level conference proceedings are often the primary channel for publishing quality work in most areas of Computer Science</mark>, and these conferences have very strict quality standards."

2010-2012

Basic CWTS analysis.
For the three CS units there was small coverage for CWTS analysis, so some additional analyses were made, based on Australia ERA 2010 for conferences and Google Scholar.

Unit	P_all	P_refereed	P_WOS	P_WOS/ P_refereed
SOFTSYS	80	62	2	3.2 %
NODES	393	337	29	8.6 %
ALKO	676	637	180	28.3 %

2014 — **Basic CWTS analysis** with some additional statistics by the library. No CS specific analyses.

2019 — **No CWTS analysis**. Instead, Google Scholar based analysis with statistics chosen by the unit.

UH RESEARCH ASSESSMENT (CURRENT EDITION)

- **Four panels:**
  - Life Sciences, Natural Sciences, Social Sciences, Humanities
- **Forward looking self assessment:**
  - Publications harvested from TUHAT CRIS
  - Filtering for currently employed researchers (future potential)
- **Choice of analysis:**
  - No CWTS analysis for Humanities, Computer Science (CS)
  - Instead, analyses agreed with these units.
  - Google Scholar was preferred by CS.

Leiden Manifesto R

4. Keep data collection and analytical processes open, transparent and simple.

Leiden Manifesto R

6. Account for variation by field in publication and citation practices

SOME THINGS TO CONSIDER

- **Refereed conference proceedings papers dominate very clearly in CS**

  - Of all refereed papers by UH CS unit of assessment, 2/3 were published in conference proceedings, 1/3 of in journals (approximately)

- **Complications from Finnish publication Forum levels for conferences**

  - Changes in the levels made these values problematic.

  - Fixing the levels was easily the most work-intensive element.

  - Feedback from the unit was necessary and useful.

  - Levels for conferences seemed to correlate well with GS citations.

- **Web of Science coverage has increased somewhat since previous evaluation**

  - …but not enough. Also, CPCI-S and CPCI-SSH are not currently included in CWTS analyses

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5. Allow those evaluated to verify data and analysis.

COVERAGE

- **Scopus has better coverage for CS than Web of Science**

  - However, the unit has preferred Google Scholar.

- **We made a comparison of the following citation databases for the CS data**

  - Google Scholar, Scopus, Dimensions, Web of Science; and used bibliographic records

    - indexed in **Google Scholar** through Publish or Perish

    - produced from **Dimensions** by organization search for University of Helsinki

    - found by DOI in **Scopus**

    - in TUHAT CRIS with **WoS** ID + extra records found by DOI in **Web of Science**

  - Which creates a minor advantage for Google Scolar and Dimensions but not a decisive one.

    - E.g., *Journal of Machine learning research* not found by DOI but indexed in Scopus.

ESTIMATES: UH-CS COVERAGE FOR YEARS 2012 - 2016

Largest ellipse – Google Scholar, blue – Scopus, red – Dimensions, black - WoS

~100 %

~92 %

~83 %

~48%
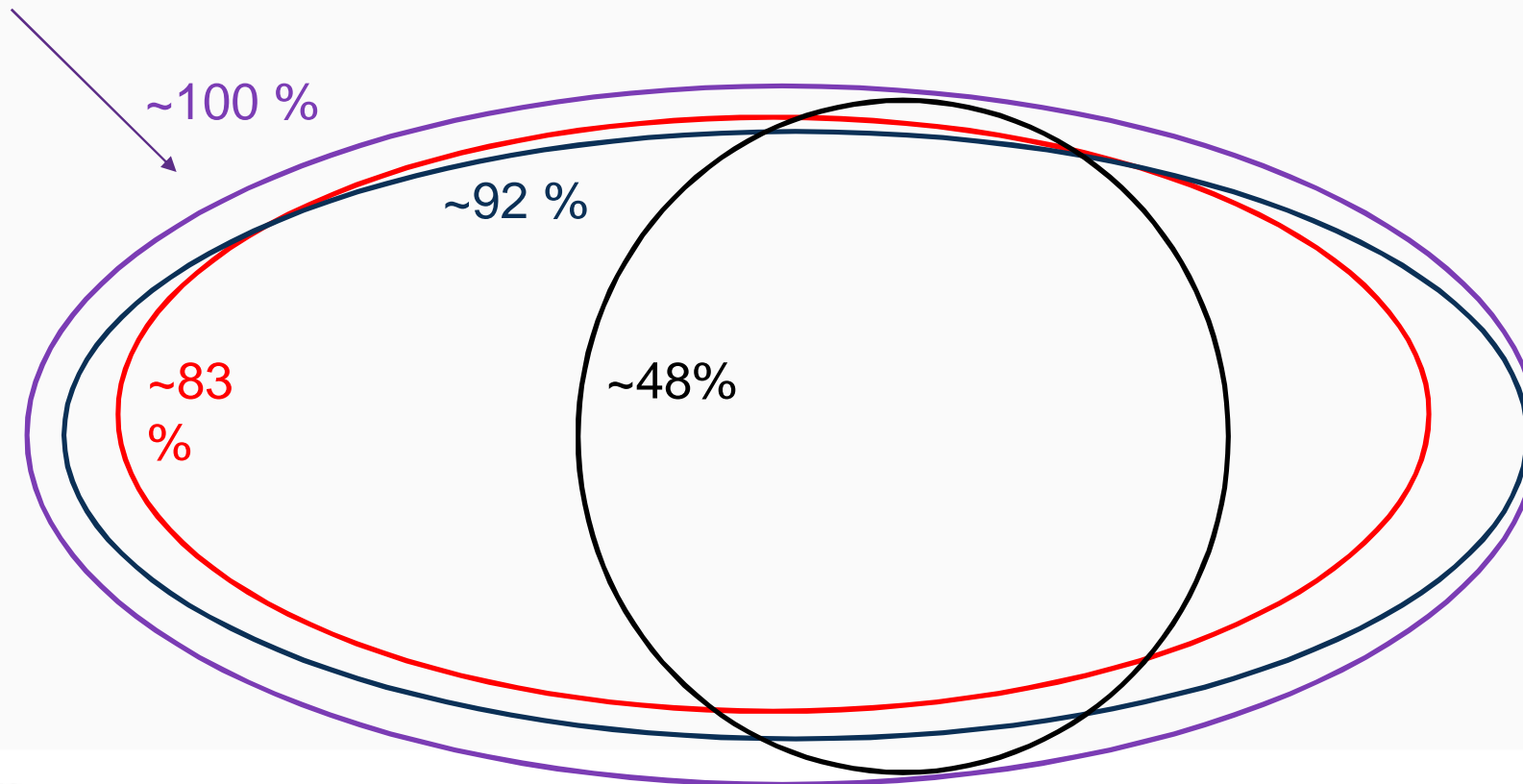
CONCLUDING FOR COVERAGE RELATING TO CS RESEARCH ASSESSMENT 2019 THAT

1. **Scopus** could have sufficed based on coverage (incl. also coverage of publication channels with h5-indeces) but **GS** definitely did with its even higher coverage and therefore also higher citation counts.

2. **Dimensions** had a reasonable coverage and some undesirable random absences, like those shown in the extract below on the right. Namely, a central publication channel (*Bioinformatics, Oxford UP*) for which 11 out of 13 publications are missing, compared to 'all found' in Scopus (and GS and WoS). Another example is (*Machine Learning, Kluwer/Springer*) w/ ¼ missing.

Bioinformatics	nf2	SCOPUS_ID:84856092738
		SCOPUS_ID:84866437252
		SCOPUS_ID:84866443256
		SCOPUS_ID:84903957321
		SCOPUS_ID:84907019441
		SCOPUS_ID:84907019526
		SCOPUS_ID:84907030857
		SCOPUS_ID:84913539196
		SCOPUS_ID:84929144218
		SCOPUS_ID:84931070273
		SCOPUS_ID:84941793060
	pub.1036431668	SCOPUS_ID:85007276054
	pub.1059414840	SCOPUS_ID:84990892368

Machine Learning	nf2	SCOPUS_ID:84865229433
	pub.1035042419	SCOPUS_ID:84976440442
	pub.1035362851	SCOPUS_ID:84880133427
	pub.1044656988	SCOPUS_ID:84880132467

3. **WoS** having the lowest coverage of about a half is not discussed further relating to this comparison.

CITATION COUNT SUMS GROUPED BY PUBLICATION TYPE (RA2019) AND YEAR (2012 - 2016)
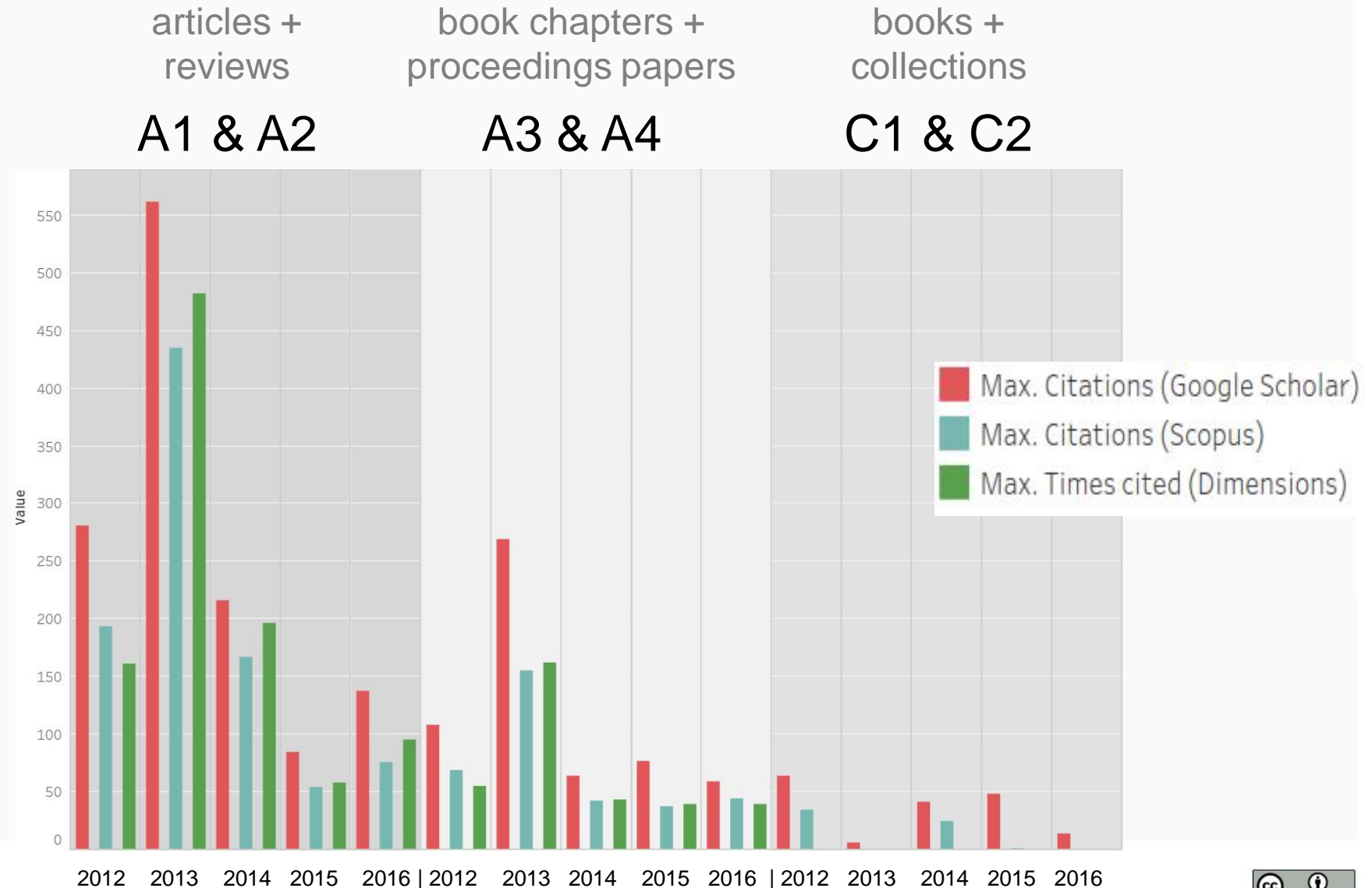
Observed that

- GS (red) systematically produces highest citation count sums with significant margin to Scopus (blue) and Dimensions (green).

- GS coverage extends over the entire set of publication types as expected and Scopus has some citations for publications in group C1 & C2.

- The importance of conference proceedings (96 % of A3 & A4) is shown by the citations counts.

- Year 2012 has lower CC than 2013, explained by changes in CS research personnel.

articles + reviews

A1 & A2

book chapters + proceedings papers

A3 & A4

books + collections

C1 & C2

Measure Names
- Sum of Citations (Google Scholar)
- Sum of Citations (Scopus)
- Sum of Times cited (Dimensions)
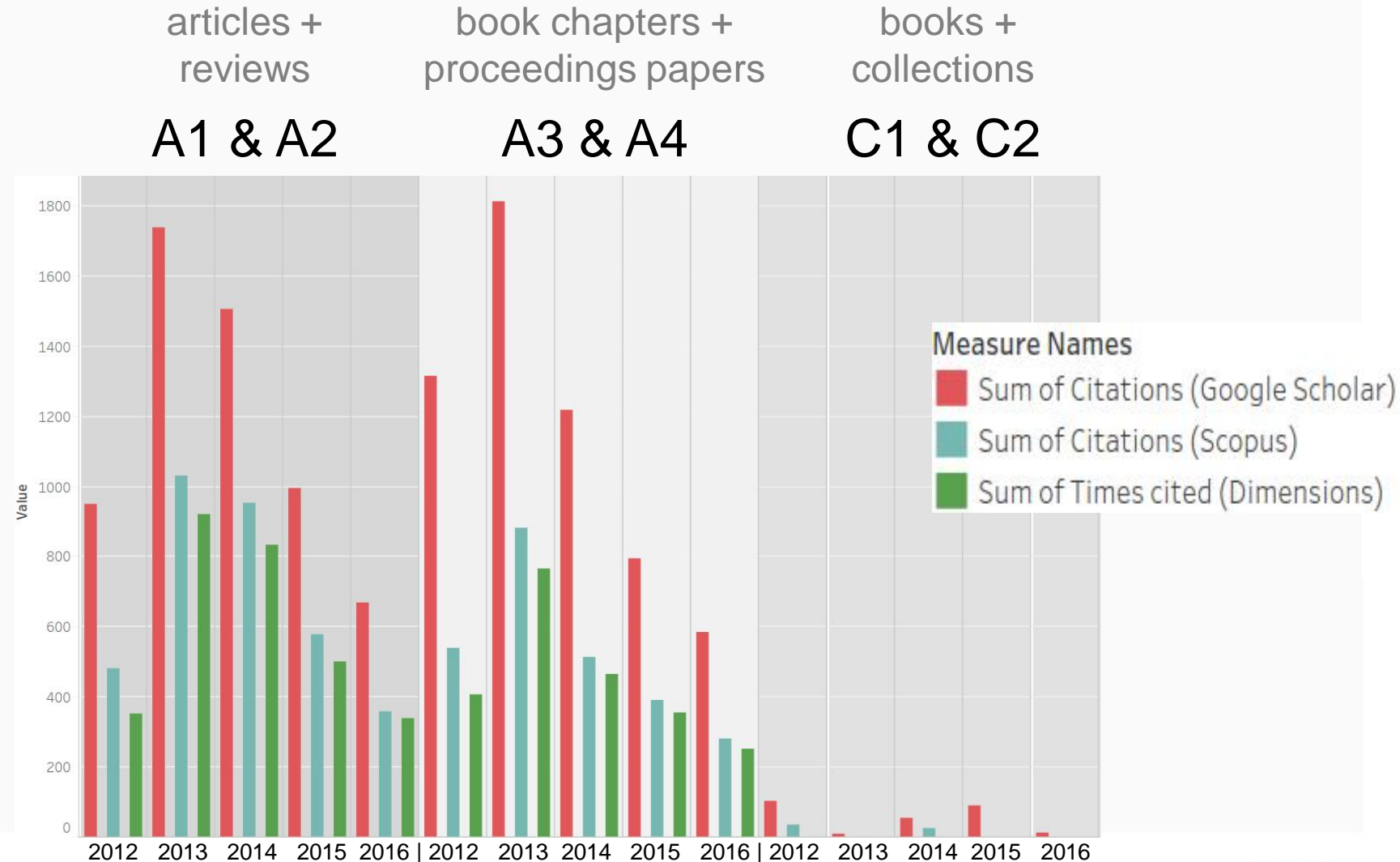
MAXIMUM CITATION COUNTS GROUPED BY PUBLICATION TYPE (RA2019) AND YEAR

- GS (red) produces also highest max citation counts and, perhaps peculiarly, Dimensions (green) shows higher max times cited than Scopus (blue) for most years.

- The highest citation counts go to articles and reviews (A1&A2) but as a group, proceedings get similar amounts of citations (previous slide).

articles + reviews
A1 & A2

book chapters + proceedings papers
A3 & A4

books + collections
C1 & C2

Legend:
- Max. Citations (Google Scholar)
- Max. Citations (Scopus)
- Max. Times cited (Dimensions)

CORRELATION OF CITATION COUNTS (PEARSON, SPEARMAN)

COR(CC_SCOPUS,CC_DIMENSIONS) = 0.992, 0.9535 AND COR(CC_SCOPUS,CC_GS) = 0.990, 0.896
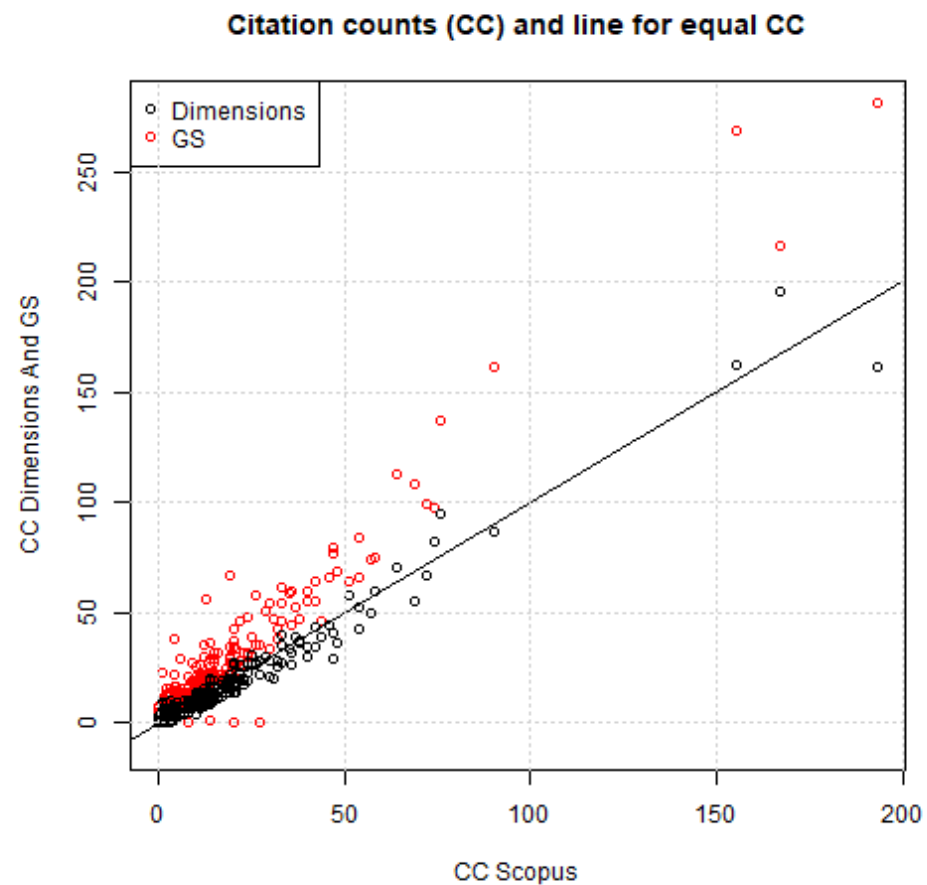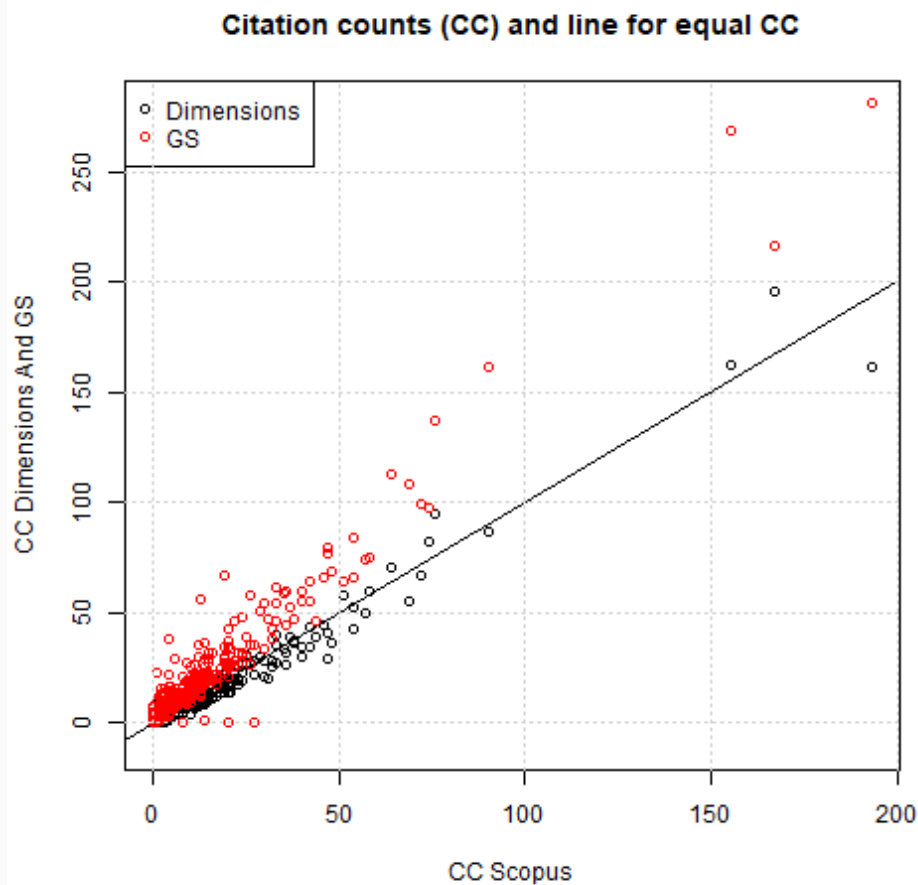
SOME CONCLUSIONS

In Finland, Web of Science based analyses dominate in research assessment

Computer Science has preferred Google Scholar, so it was chosen for the current Univ Helsinki assessment for CS, but in hindsight Scopus could have been adequate

Nevertheless, based on observed coverage and citation counts, Google Scholar was a suitable source

Types of counted citations was not studied, but their amounts show consistency by correlating strongly (between GS, Scopus and Dimensions)

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THANK YOU!

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