Crossover Authors:
Bibliometric Study in Computer Science

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Outlines

- **Background**
- Methodology
- Empirical Result
- Conclusion

Crossover Author

- *UI co-authored paper*
  - author affiliations include at least a university and at least an enterprise
- *Crossover paper*
  - at least an author having multiple affiliations simultaneously
    - at least a university, and
    - at least an enterprise
  - this author is referred to a *crossover author*

Crossover Author

- C*rossover author*
  - may be an enterprise employee who is also in the adjunct faculty of a university, or
  - a member of university faculty on secondment to an enterprise
- Crossover researcher/Double employment
  - individuals who have or had one or more university affiliations as well as one or more affiliations with an enterprise in recent years

Crossover Author

- indicates a greater and tighter degree of collaboration between academia and industry
- signifies a more efficient form of knowledge transfer

Purpose of Study

- The trends and patterns of crossover papers and crossover authors
  - The crossover papers that are also cross-country
  - Universities and enterprises that are more frequently involved in crossover papers
- From two separate periods, 2002 to 2011 and 2012 to 2018
  - This study reports the result from the first period 2002-2011

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Dataset

- Papers from SCI-indexed Computer Science journals
  - From two JCR sub-fields
    - Hardware & Architecture
    - Software Engineering
  - 18 journals having the highest Impact Factors in the two subfields
- 12,713 UI co-authored papers published between 2002 and 2011
  - 478 crossover papers

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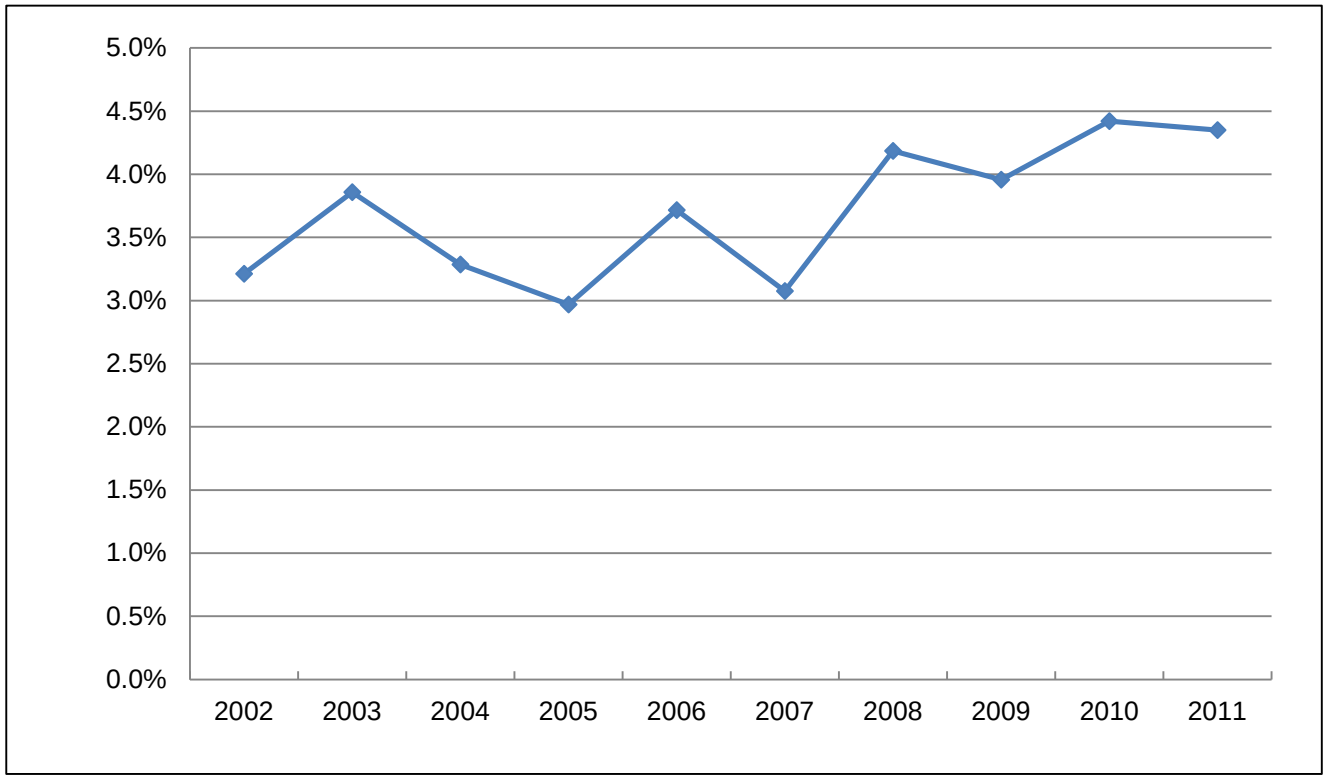
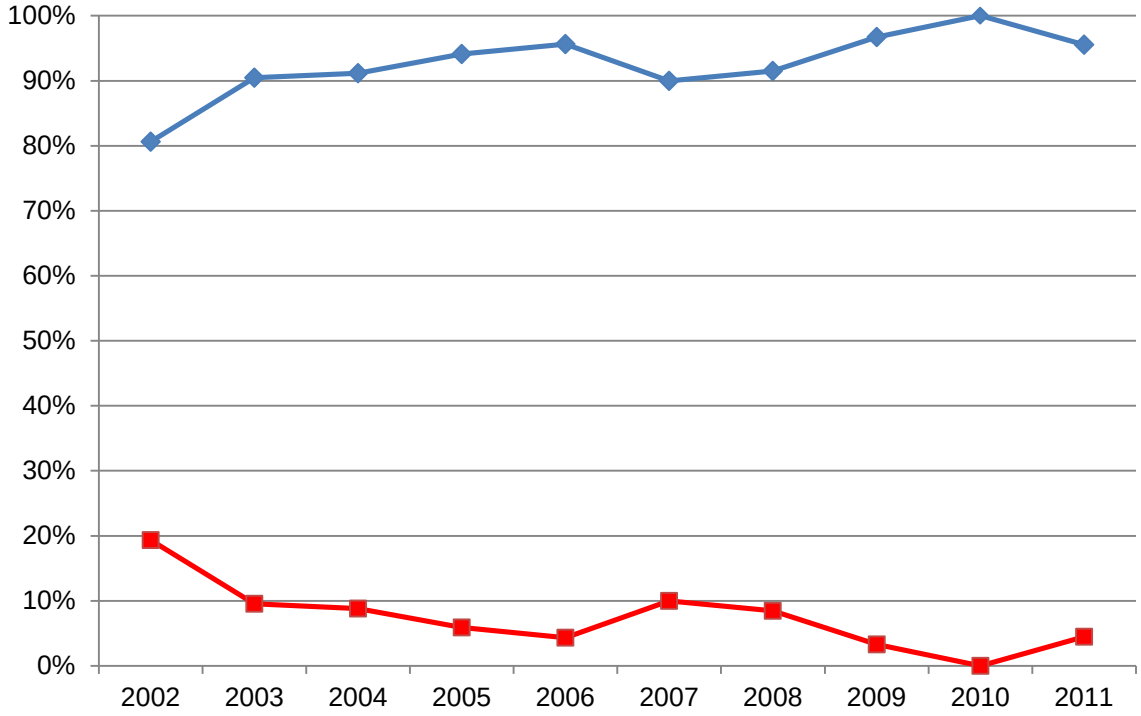
Share of crossover papers among UI co-authored papers



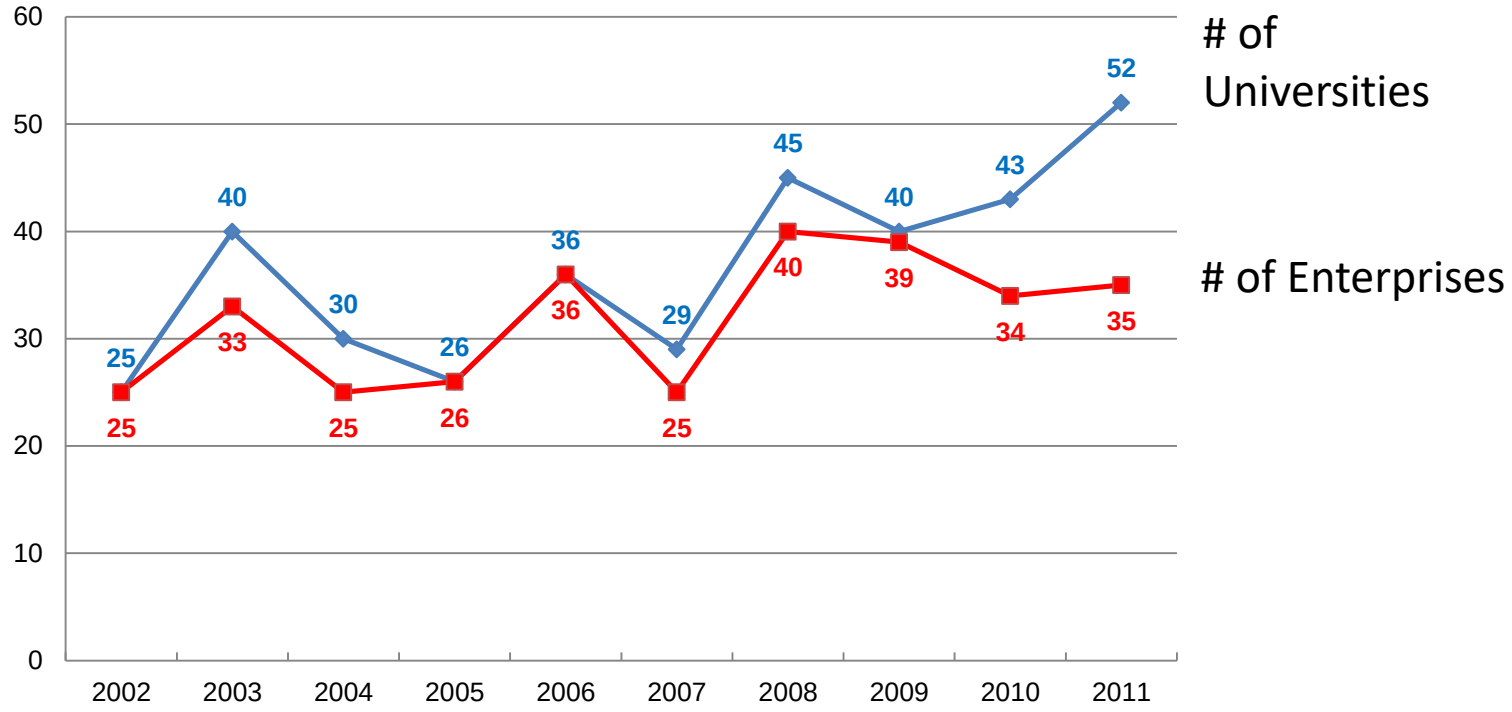
- Crossover papers and crossover authors are not yet a common phenomenon during this early period

Shares of single-author and multi-author crossover papers



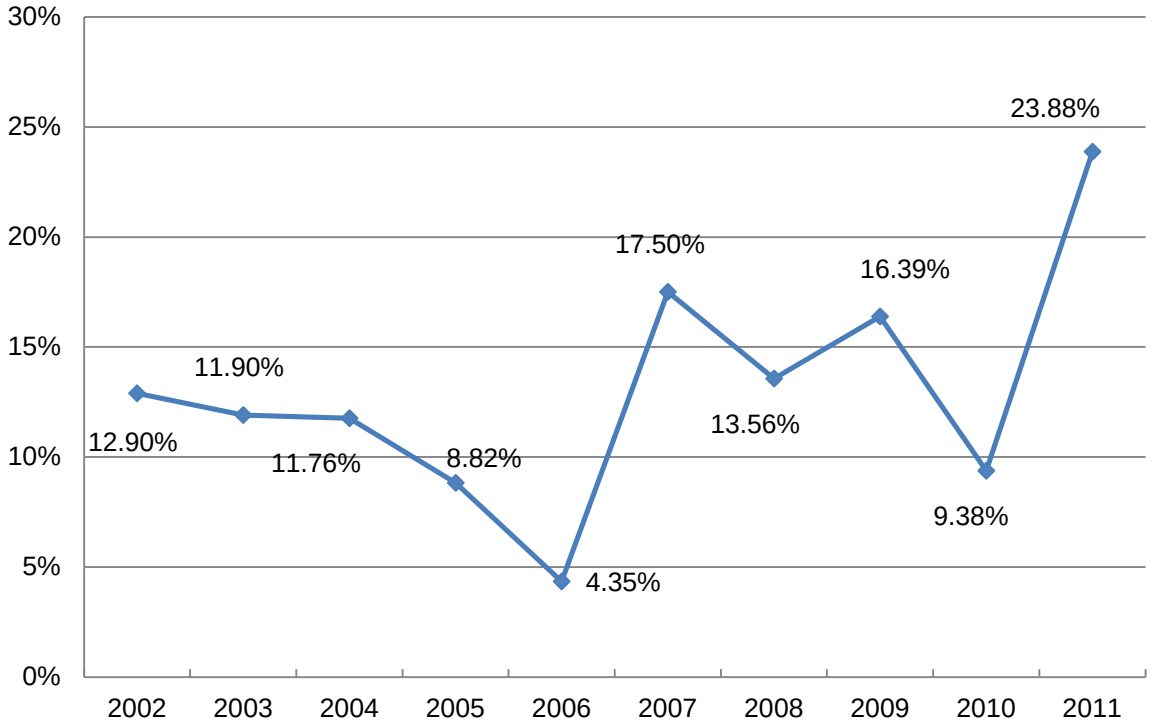
- Most crossover papers are produced by at least a crossover author working with one or more other authors
- As to the multi-author crossover papers, 37% of them have the crossover authors as the first authors or corresponding authors.

Number of universities and enterprise involved in crossover papers



- Tnumber of unversities involved each year is always greater than that of the enterprises
- There is a generally increasing trends in the number of universities involved

Shares of cross-country papers among crossover papers



- More than 75% of crossover papers are produced domestically each year
  - suggesting that locality or proximity is a key factor for crossover papers

Top 10 countries of crossover papers

Rank	Country	# of crossover papers	% to all crossover papers	# of cross-country, cross over papers	% to the country's crossover papers
1	USA	290	60.67%	50	17.24%
2	China	41	8.58%	5	12.20%
3	Switzerland	35	7.32%	13	37.14%
4	Germany	24	5.02%	8	33.33%
5	Sweden	15	3.14%	6	40.00%
6	UK	13	2.72%	8	61.54%
7	Canada	12	2.51%	5	41.67%
7	Japan	12	2.51%	1	8.33%
9	Spain	11	2.30%	3	27.27%
9	India	11	2.30%	3	27.27%

- may have to do with the degree of leniency of regulations towards researchers employed both by universities and enterprises?

Top 10 institutions producing crossover papers

Rank	Institution	# of crossover papers	% to all crossover papers	% to intitution's co-authored papers	# of crossover authors
1	Microsoft Corp.	58	12.13%	12.18%	49
2	Stanford University	46	9.62%	15.65%	29
3	Intel	33	6.90%	17.01%	28
4	University of Washington- Seattle	31	6.49%	20.81%	22
5	Disney	28	5.86%	60.87%	21
5	IBM	28	5.86%	7.91%	26
7	Adobe Systems Inc.	24	5.02%	40.00%	7
8	Swiss Federal Institute of Technology- Zurich	23	4.81%	14.11%	15
9	Tsinghua University	20	4.18%	19.80%	10
10	MIT	16	3.35%	5.50%	13
10	Industrial Light & Magic	16	3.35%	66.67%	5

- For universities (grey background), their crossover papers account for only a low percentage to their co-authored papers

Top 5 universities and enterprises having crossover author concentrations

Top 5 univeristies	# of partners	HHI	Top 5 enterprises	# of partners	HHI
Tsinghua University	3	0.66	Disney	10	0.27
Swiss Federal Institute of Technology- Zurich	7	0.41	Google	10	0.15
University of California-Berkeley	7	0.18	Intel	17	0.11
University of Washington-Seattle	10	0.17	IBM	19	0.10
Stanford University	18	0.09	Microsoft Corp.	25	0.07
Average	9	0.30	Average	16.2	0.14

- Enterprises do have a higher average number of partnering institutions (16.2) than that of the universities (9), suggesting that the enterprises are more likely to share researchers with multiple universities than the other way around

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Conclusion

- Crossover papers and crossover authors are not common during this early period
- The crossover papers are usually produced by at least a crossover author working with one or more other authors
- The crossover authors are often not the first or corresponding authors
- There are more unitversities than enterprises involved in the crossover papers.

Conclusion

- Most crossover papers are produced domestically
- USA is the obvious leader in crossover papers and cross-country papers
  - However, USA's crossover papers involve few universities and enterprises from other countries
  - For overseas crossover authors, their crossover papers often have affiliations with USA universities or enterprises
- The enterprises have a higher average number of crossover relationships than that of the universities

Thank You