

Updated Analysis of Current and Future Computer Science Needs via Advertised Faculty Searches for 2021

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Abstract

This updated work follows a full study released in November 2020, on faculty hiring in Computer Science for hires starting in 2021. That work analyzed hiring based on ads through mid-November 2020 and found significant decreases in the number of institutions searching and the number of positions being sought. This updated work considers ads through the end of December 2020 and is intended to understand the impact of the COVID-19 pandemic on whether searches have been delayed or simply will not materialize this hiring season.

In this updated work, we analyzed ads from 319 institutions seeking to fill tenure-track faculty positions in Computer Science, which is an increase from 235 institutions as of mid-November 2020.. This updated number is still a 29% decrease from last year at this time and the lowest number in five years. The number of tenure-track positions sought in the updated time period shows a 32% decrease from last year at the same time and is also at the lowest level in five years. Despite being significant, these decreases are not as sharp as reported in our original study where the number of institutions searching was down by 40% and the number of positions being sought showed a one-year drop of 50%. These updated results indicate that search ads were posted later than in previous hiring seasons, but the increase in delayed ads did not make up for the total number of positions being sought.

In terms of updated results based on type of institutions, public PhD institutions still show the biggest reduction with a 40% one-year decrease in the number of positions being sought. However this drop had been 62% in the original study indicating both ads that were delayed and never materialized since mid-November.

Not surprisingly, the updated results show little difference from our original study for specific areas being sought with results for each area within one percent of those previously presented. The clustered area of AI/Data Mining/Machine Learning is now at 21%, Security at 19% and Data Science at 12% of all positions sought. Data-oriented areas account for 35% of all positions.

1 Introduction

Following up on a full study released in November 2020 [1], this is an update on faculty hiring in Computer Science for hires starting in 2021. The initial study showed a significant drop in faculty hiring for this hiring season no doubt in large part due to the COVID-19 pandemic. This update is intended to understand whether searches have been delayed or simply will not materialize this hiring season.

2 Methodology

The rationale and details of the work can be found in the full study [1]. This updated work employs the same methodology and analysis as previously described, but extends the time period in which ads were captured from mid-November to the end of December 2020. It makes longitudinal comparisons with previous years for data gathered between August and the end of December in each hiring season.

3 Results

3.1 Institutions and Positions

Using the same methodology as previously described for ads between August and the end of December 2020, our updated dataset now contains information for faculty searches from 319 institutions, which is an increase from 235 institutions as of mid-November 2020. However, it still significantly lags results from December 2019 when 448 institutions were seeking faculty for the 2020 hiring season.

The left-side of Figure 1 shows five years of results for the number of institutions searching for tenure-track faculty based upon ads appearing by the end of December in the preceding calendar year. It shows a 29% decrease from last year at this time and the lowest number in five years. As comparison, results from mid-November had shown a 40% one-year decrease.

Similarly, the right-side of Figure 1 shows the total number of positions searched for with a total of 590 positions (vs. 413 positions in mid-November 2020). This total compares with 868 positions at this time last year for a 32% one-year decrease (compared to a 47% one-year decrease based on mid-November ads). Again, results in the figure show the number of positions being sought is at a five-year low.

3.2 Clustered Area Results Comparison with Previous Years

Figure 2 shows a comparison of clustered area results based on percentage of positions for the past five years of our studies using ads posted by the end of December each year. Clustered areas are ordered based on 2021 percentages. Not surprisingly, 2021 results for each area are within one percent of those presented in [1] with AI/Data Mining/Machine Learning now at 21%, Security at 19% and Data Science at 12%. Aggregating the Data Science, AI/DM/ML and Databases clusters results in 35% of all hires sought in these data-oriented areas.

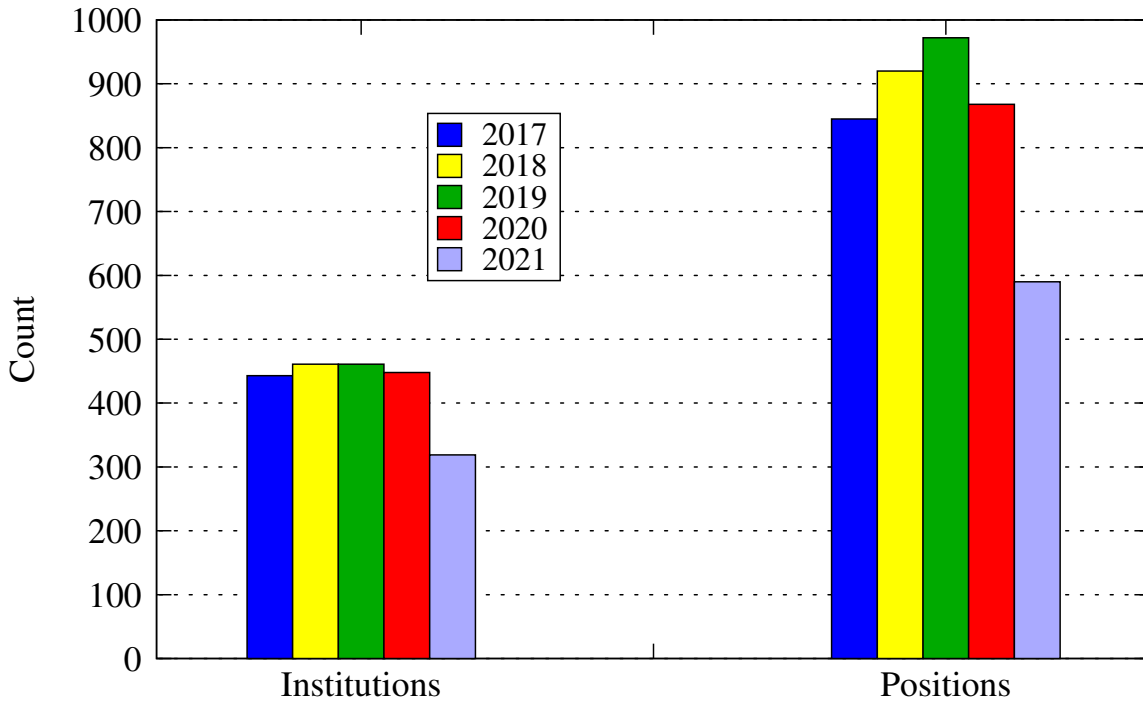


Figure 1: Five-Year Results for Number of Institutions Searching and Total Number of Positions Being Sought

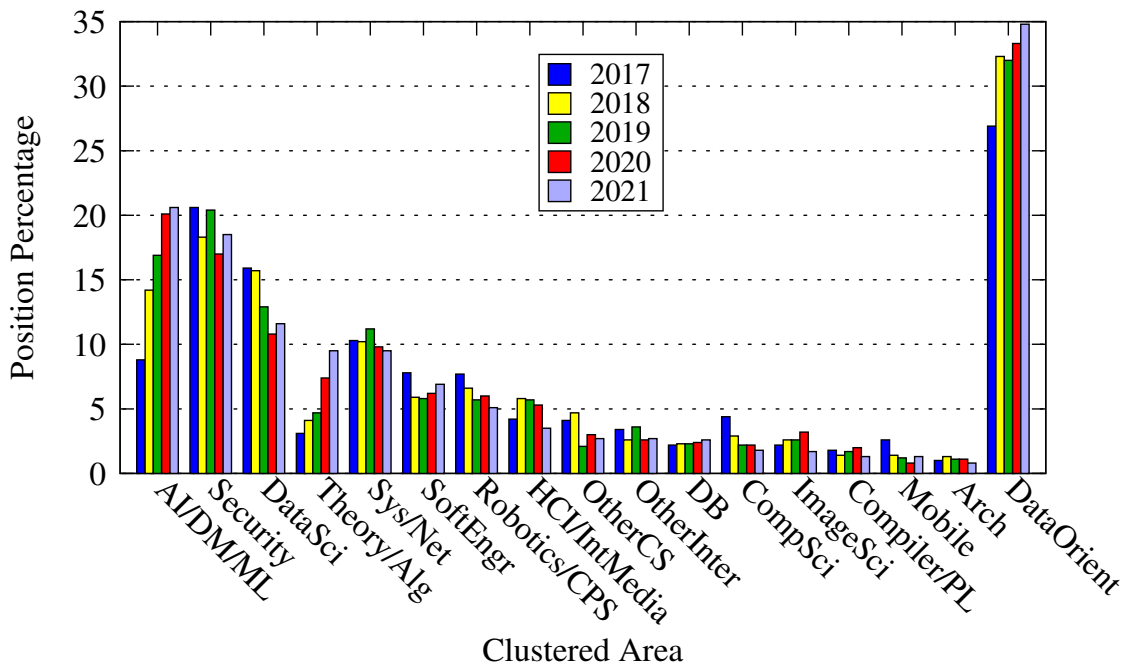


Figure 2: Five-Year Comparison of Clustered Area Percentage by Positions

4 Results by Type of Institution and Highest Degree Offered

Figure 3 repeats analysis based on the highest degree offered from [1] in showing the number of institutions searching and positions being sought for ads through the end of December in each of the past five hiring seasons. The left-side of the figure shows longitudinal results for the number of institutions searching over the five-year period. The number of institutions dropped for all types this year with the number at five-year lows for each.

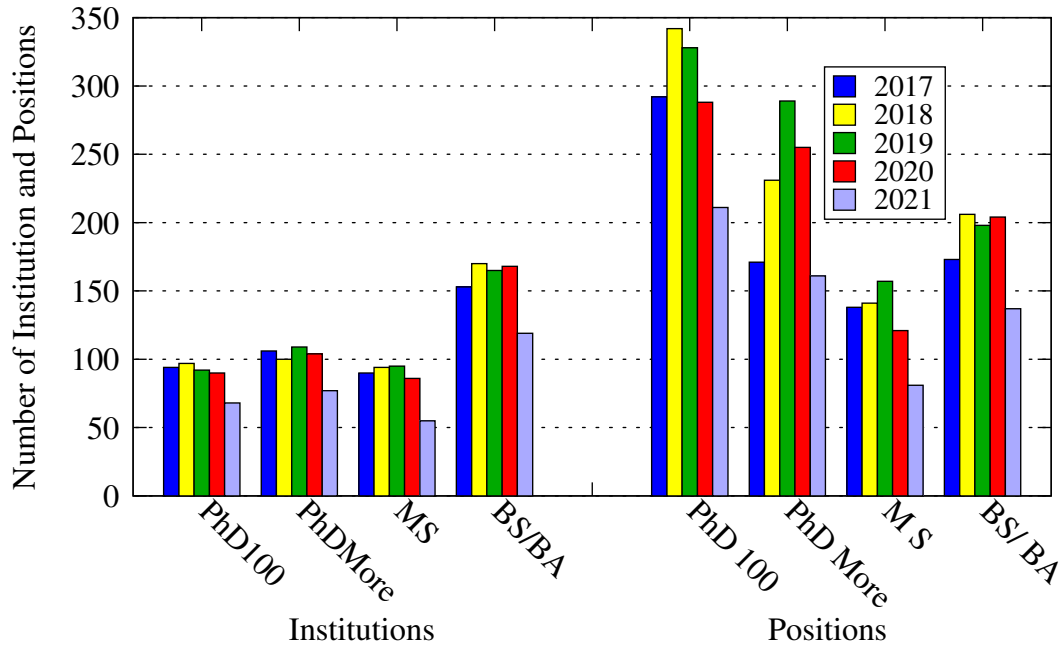


Figure 3: Five-Year Counts of Institutions Searching and Positions Being Sought by Highest Degree Offered

The right-side of Figure 3 shows five-year results for the number of positions being searched for by the four types of institutions. It shows that the number of positions being sought by PhD100 and PhDMore institutions dropped in one year by roughly a third in 2021 for ads through the end of December, although it was down in one year by roughly 50% for ads through mid-November [1]. As shown, the number of positions being sought for all types of institutions is at a five-year low.

4.1 Results by Combination of Institution Type and Highest Degree Offered

A final longitudinal analysis of position searches is shown in Figure 4 with five-year results for the number of institutions searching and the number of positions sought based on a combination of type and highest degree offered. The left side of the figure shows a one-year decline for all institution groups with a 33% one-year decline for public PhD institutions (it was 51% for ads through mid-November [1]). It shows the number of public and private PhD institutions searching to be at five-year lows.

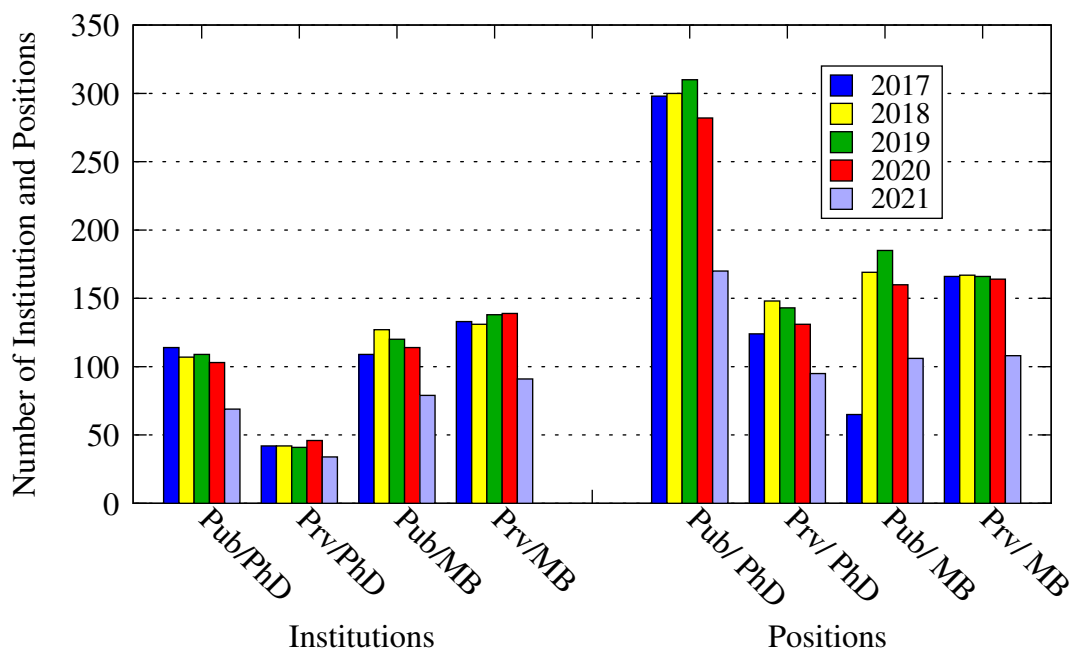


Figure 4: Five-Year Counts of Institutions Searching and Positions Being Sought by Institution Type and Highest Degree Offered

The right side of the figure shows the number of positions sought for ads through the end of December decreased in 2021 for each grouping of institutions. This drop-off is particularly striking for public PhD institutions where there is a five-year low and a 40% one-year decrease in the number of positions being sought, which is significant, but not as severe as the 62% one-year drop shown in [1].

5 Summary and Future Work

This updated work follows a full study released in November 2020, on faculty hiring in Computer Science for hires starting in 2021. That work analyzed hiring based on ads through mid-November 2020 and found significant decreases in the number of institutions searching and the number of positions being sought. This updated work considers ads through the end of December 2020 and is intended to understand the impact of the COVID-19 pandemic on whether searches have been delayed or simply will not materialize this hiring season.

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The next step is to monitor how these ads translate into actual hires for this hiring season. The long-term future work is to understand how faculty hiring in Computer Science will continue to be impacted by the COVID-19 pandemic.

References

- [1] Craig E. Wills. Analysis of current and future computer science needs via advertised faculty searches for 2021. *CRA Bulletin*, December 2020. See technical report for details of study. <http://www.cs.wpi.edu/~cew/papers/CSareas21.pdf>.