

Scholar Plot: A Compact and Scalable Visualization Method for Academic Careers

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Keywords: Visualization of academic records; academic evaluation; data visualization; team science

Abstract: In this paper, we present Scholar Plot (SP), a compact visualization of academic merit. SP is a scale space framework, enabling the user to gain insight about individual academic entities and their relative contribution to aggregate academic entities. SP's base level covers academics, its second level departments, and its third level colleges. At each level, SP packs in a figure multi-faceted information about the entity's publication, citation, and funding profiles. SP draws data from open sources, including Google Scholar, the Journal Impact Factor List, and Open Data. Initial feedback through a focus group and a survey study, show that SP is well received by the intended users, having high potential in serving as a complementary assessment tool in merit reviews and an insightful aid in search of an advisor or department. Next steps in this line of research include: a) SP's endowment with a wiki function for faster population of its department and college levels; and b) a longitudinal study to understand SP's usage patterns in practice, feeding back to the design cycle.

Base Level Visualization: The base level of Scholar Plot (SP) visualizes individual academic records. The first issue we had to address as part of the design process for this level was to determine what to visualize. To answer this question, we looked at the merit criteria considered by promotion, tenure, and search committees; these are: a) publication quality and quantity, and b) research funding. Furthermore, publication quality is defined by two factors: citation counts and prestige of the journals where the publications appeared. Accordingly, we decided to structure individual scholar plots as two-panel arrangements - the top panel visualizing the individual's publication record, while the bottom panel visualizing the individual's research funding record. This arrangement brings to the fore any causal relationship that may exist between funding and publishing, as publication production is often powered by research dollars. The common timeline in the horizontal axes of the two panel graphs facilitates such an association.

Group Level Visualization: Scholars do not pursue research in vacuum. They live and work within academic departments and academic departments cluster in colleges. The next two levels of Scholar Plot (SP) are group levels, visualizing scholarship in departments (aka Department Plot) and colleges (aka College Plot). In these aggregate plots it is important to show how much each constituent entity's record contributes to the aggregate score for the specific merit indicator. For this reason, Department and College Plots make heavy use of pie charts.

Conclusion: The basic idea behind SP is to facilitate instant insights regarding different strengths of academic records, supporting the work of evaluation committees and the curious academic in search of an advisor or department. One of SP's strengths is that it draws data from open sources that are inclusive. This creates, however, a technical problem because Google Scholar - a key open source used by SP - does not offer an application-programming interface. For the base level of SP we solved this problem with sophisticated data scraping assisted by a simple one-time wiki function: if the individual sought by the user is not recognized by SP, then SP asks the user to copy and paste the targeted individual's Google Scholar URL; SP remembers it thereafter, automatically recovering the scholar's data every time a user requests it by name. For the department and college levels, a wiki function is in the works.