Chapter 9
Your Personal, Virtual Librarian

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ABSTRACT

Searching scientific literature is a common and critical activity for research scientists, students, and professionals such as medical clinicians. These search tasks can be time consuming and repetitive, but literature search and management tools are already making the job much easier. This chapter analyses the literature retrieval process, reviews some currently available tools and elaborates on potential future support for the knowledge worker by an intelligent automated assistant. A special focus of this chapter is the automatic retrieval of medical literature and the exploration of the answer space.

INTRODUCTION

Before the Internet revolution, researchers physically went to the library to find the publications they needed for their studies. They spent hours trying to fish the right index cards out of little drawers in numerous rows of cabinets to identify books and papers that might guide their work. Librarians then fetched the needed materials and passed them out to the reader. The turnaround time could be hours, days, or
even weeks if the publication had to be ordered from overseas. Later, librarians got access to computers and translated readers’ needs into queries to retrieve the meta-information about the requested literature. Beyond their retrieval tasks, experienced librarians also helped students to identify popular books or drew their scientists’ attention to new publications in their field.

Today, almost every researcher has a computer on their desk and is able to send queries to search engines all over the world—including literature retrieval engines—and retrieve references, even full papers, within minutes. However, do the new systems provide you with all the benefits you got from your librarian? Are they the perfect solution for your literature retrieval needs, or is there much room for improvement?

We will describe existing systems currently available commercially or free, and present current research efforts to improve literature retrieval. The need for literature retrieval depends on the role and the field of the researcher as well as the task they wish to achieve. This chapter focuses on literature retrieval for computer scientists, and on medical literature retrieval for clinicians or medical researchers.

Information Needs

In what circumstances do scientists search the literature?

We will discuss six typical scenarios:

- Finding a specific publication
- Finding related publications
- Staying up to date in the field
- Entering a new field
- Special domain: Medical research.

Finding a Specific Publication

Almost all scientific publications provide a list of references to related material, similar to the way that URLs are used to refer to Web pages on the Internet. While the hyperlink mechanism embedded in the World Wide Web allows us to follow a URL by clicking on the anchor text, bibliographic references once had to be resolved by visiting the library, accessing the referenced journal issue and finding the cited article within. A scientist may need to access cited references to fully understand the paper they are reading or to learn about related work. References to specific publications may also be made by reviewers when the scientist submits his own work for publication. Furthermore, specific references are often made in casual
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