

Digital Mathematics Library: A Vision for the Future

In light of mathematicians' reliance on their discipline's rich published heritage and the key role of mathematics in enabling other scientific disciplines, the Digital Mathematics Library strives to make the entirety of past mathematics scholarship available online, at reasonable cost, in the form of an authoritative and enduring digital collection, developed and curated by a network of institutions.

-Vision statement, Cornell University DML Project, 2003-2004

The *Committee on Electronic Information and Communication (CEIC)* of the *International Mathematical Union* endorses this vision of a distributed collection of past mathematical scholarship that serves the needs of all science, and encourages mathematicians and publishers of mathematics to join together in implementing this vision.

The Digital Mathematics Library should include a substantial part of the past literature, and, most importantly, its components should be connected, both to each other and to the current literature. This can begin most easily by focusing on journals. The ultimate goal is to create an enduring network of digital literature, most of which can be seamlessly traversed by all scientists engaged in mathematical research and scholarship.

In order to achieve this goal, each article (or item) in a digitization project should include four components:

1. Accurate metadata consistent with agreed upon standards.
2. A separate list of references (when available) with links to the indexing databases *Mathematical Reviews* and *Zentralblatt Math*.
3. A high-quality scanned image of each page
4. The text derived from optical character recognition (which is normally hidden from the reader, but keyed to the image for searching).

Optionally, projects may add tags associated to certain non-text components of the images (for example, figures, tables, and equations) for possible future use. While some components may be missing from some projects, having all four in as many projects as possible will greatly enhance the usefulness of the effort.

In order to coordinate many such interconnected projects, the *CEIC* encourages the reviewing and indexing services, *Mathematical Reviews* and *Zentralblatt Math*, to cooperatively create and maintain a *registry* of digitization projects. This registry should contain comprehensive information about current and planned projects, and the information should be accessible to all mathematicians.

The *CEIC* believes that the digital mathematics library can be undertaken in a way that serves the interests of all those involved in the creation and maintenance of scholarly

literature. Scientists clearly benefit because they will have access to a vast collection of past literature with the ability to identify not only individual parts but entire networks of interrelated material, easily moving from one article to another. Librarians will be able to focus on current collections rather than managing old paper volumes, which are often in storage.

Those who publish journals will benefit as well, mainly because of the substantial added value to current subscription journals. If almost all references in almost all current journals are linked to accessible past literature, then each new article serves as a gateway to the past mathematical literature. There is no surer way to make current journals more valuable. Although we anticipate that many publishers will make their full content freely available only when it has reached a certain minimum age (five years has been widely discussed), we encourage all publishers to strive to make this kind of delay as short as possible and to make all metadata freely accessible in order to make this network of literature more valuable.

This vision of a distributed library of digitized past literature has many benefits, including better electronic archiving and broader access for the developing world. The primary reason for carrying out this vision is simple, however: Each generation of scholars leaves behind a legacy for the next, and in the present environment of change in scholarly communication we have a special responsibility to leave a legacy of which we can be proud. We can leave no better gift for future generations than a digital mathematical library of the past.

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