

Digital Mathematics Library in Japan

領域2「数学ポータル構築」

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Open Access Summit, June, 2013, NII

Abstract

The notion of Digital Mathematics Library (DML) is based on World Digital Mathematics Library formulated by International Mathematical Union. Because there are various forms of mathematical literature which differ by country, each country was expected to construct their DML.

In Japan, there are over 200 mathematical journal titles and about 70,000 articles indexed by *Mathematical Reviews*. That is the target of our DML called DML-JP. Half of the articles are found in DML-JP, which are harvested from 17 repositories.

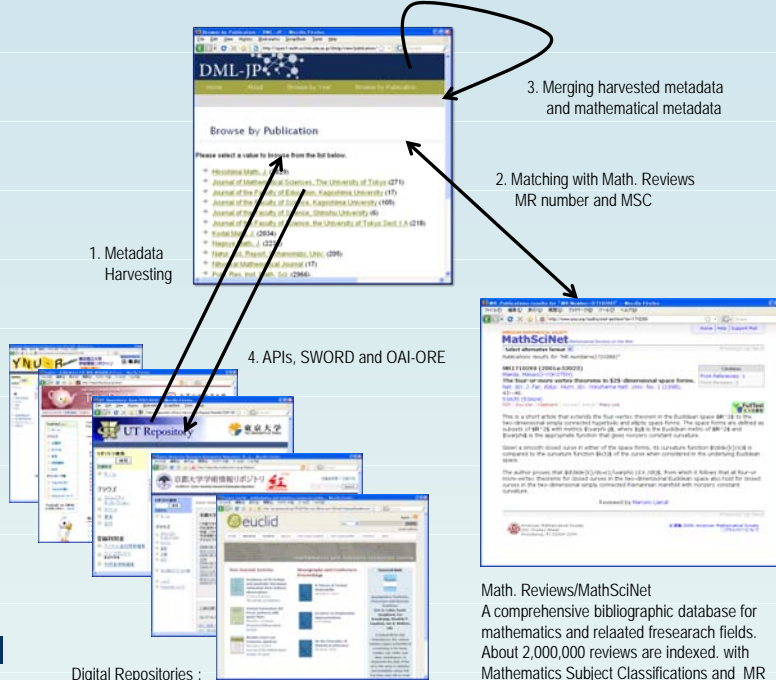
Electronic edition of major journal titles are joined with Project Euclid and many institutional repositories contain relatively small scale journals. Because these platforms have OAI-PMH facility, we could construct DML-JP as a metadata based repository by metadata harvesting.

Furthermore, MR number and Mathematics Subject Classifications on each article in *Mathematical Reviews* are added.

In the future we are going to realize mirroring of open access full text and identify with preprint on arXiv.org.

DML-JP: System Diagram

<http://sparc1.math.sci.hokudai.ac.jp/dmljp/>



Digital Repositories : 68 mathematical journals from 40 repositories and about 30,000 metadata within 70,000 items published from mathematical journals in Japan.

Math. Reviews/MathSciNet
A comprehensive bibliographic database for mathematics and related research fields. About 2,000,000 reviews are indexed, with Mathematics Subject Classifications and MR number for each item.

List of Journals

Here is the list of journals. In these journals, about 50,000 articles have been aggregated within 70,000 articles indexed in *Math. Reviews* as contributions of mathematical journals in Japan.

- Bull. Tokyo Gakugei University Sec. I
- Bulletin of College of Science the University Ryukyu
- Hiroshima Math. J.
- Hokkaido Mathematical Journal
- J. Math. Soc. Japan
- Japan J. Indust. Appl. Math.
- Journal of Mathematical Sciences, The University of Tokyo
- Journal of the Faculty of Education, Kagoshima University
- Journal of the Faculty of Science Shinshu University
- Journal of the Faculty of Science, the University of Tokyo Sect 1 A
- Journal of the Faculty of Science, Yamagata University
- Nagoya Math. J.
- Kodai Math. J.
- Nat. Sci. J. Fac. Educ. Hum. Sci. Yokohama National University Sec. I
- Natur. Sci. Report. Ochanomizu. Univ.
- Nihonkai Mathematical Journal
- Osaka J. Math.
- Proc. Japan Acad. Ser. A Math. Sci.
- Publ. Res. Inst. Math. Sci.
- Reports of the Faculty of Science and Engineering, Saga University. Mathematics
- RIMS Kokyuroku
- Ryukyu Mathematical Journal
- Sci. Rep. Yokohama National University Sec. I
- The science reports of the Kanazawa University
- Tohoku Math. J.
- Tokyo J. of Math.
- Tsukuba Journal of Mathematics

1-1. Metadata format: oai_dc in Project Euclid

In metadata format oai_dc, bibliographic information is described in identifier tag. It causes decomposition problem.

```
<record>
<header>
<identifier>oai:CULEuclid:euclid.jmsj/1240435759</identifier>
<datestamp>2009-04-23</datestamp>
<setSpec>jmsj</setSpec>
</header>
<metadata>
<oai_dc>
<dc:title>Minimal 2-regular digraphs with given girth</dc:title>
<dc:creator>BEHZAD, Mehdi</dc:creator>
<dc:subject>05C20</dc:subject>
<dc:publisher>Mathematical Society of Japan</dc:publisher>
<dc:dates>1973-01</dc:dates>
<dc:type>Text</dc:type>
<dc:format>application/pdf</dc:format>
<dc:identifier>
  http://projecteuclid.org/euclid.jmsj/1240435759
</dc:identifier>
  J. Math. Soc. Japan 25, no. 1 (1973), 1-6
</dc:identifier>
<dc:identifier>doi:10.2969/jmsj/02510001</dc:identifier>
</oai_dc>
</metadata>
</record>
```

2. Getting mathematical Metadata

For each articles, MR number which is the serial number on Math. Reviews and Mathematics Subject Classification are added to original metadata. And publication titles are modified to Math. Reviews one.

```
<msc_p>20J06</msc_p>
<msc_c>item>20C25</item></msc_c>
<mr>1317509</mr>
```

From Junii2 to EPrintsXML

Adding mathematical metadata to EPrintsXML

3. Final Metadata Format: EPrintsXML

```
<eprint xmlns="http://eprints.org/ep2/data/2.0">
<type>article</type>
<isPublished>pub</isPublished>
<subjects>item>20-xx</item>item>QA</item></subjects>
<publication>
  Natur. Sci. Report. Ochanomizu. Univ.
</publication>
<title>
  Note on the Schur multiplier of a certain semidirect product
</title>
<creators_name>item<family>Horie</family>
  <given>Mitsuko</given></item></creators_name>
<official_url>http://hdl.handle.net/10083/839</official_url>
<pagerange>85-88</pagerange>
<volume>45</volume>
<date>1994-12-15</date>
<publisher>Ochanomizu University</publisher>
<msc_p>20J06</msc_p>
<mr>1317509</mr>
<related_url>item>
  <url>http://www.ams.org/mathscinet-getitem?mr=1317509</url>
<type>MathSciNet</type></item></related_url>
</eprint>
```

4. APIs, OAI-ORE Atom serialization

For digital repositories, APIs which return mathematical metadata, JavaScript based, SWORD and ORE are provided. The following is an example of ORE serialization.

```
<!-- Aggregated Resources -->
<atom:link href="http://projecteuclid.org/euclid.kmj/1138846413"
  title="A remark on derived spaces"
  rel="http://www.openarchives.org/ore/terms/aggregates" />
<atom:link href="http://projecteuclid.org/euclid.tmj/1192117987"
  title="Spectral synthesis in the Fourier algebra and
  the Varopoulos algebra"
  rel="http://www.openarchives.org/ore/terms/aggregates" />
```

1-2. Metadata format: junii2 in IRs

In metadata format junii2, publication title differs from Math. Reviews.

```
<metadata>
<meta xmlns="http://ju.nii.ac.jp/junii2">
<title>
  CONDITIONALLY TRIMMED SUMS FOR INDEPENDENT RANDOM VARIABLES</title>
<creator>KASAHARA, Yuji</creator>
<NDC>400</NDC>
<publisher>Ochanomizu University</publisher>
<type>Article</type>
<NIType>Departmental Bulletin Paper</NIType>
<format>application/pdf</format>
<format>191755 bytes</format>
<URI>http://hdl.handle.net/10083/843</URI>
<fullTextURL>
  http://teapot.lib.ocha.ac.jp/ocha/bitstream/10083/843/1/KJ00004470846.pdf
</fullTextURL>
<issn>00298190</issn>
<NCID>AN00033958</NCID>
<jtitle>お茶の水女子大学自然科学報告</jtitle>
<volume>46</volume>
<issue>2</issue>
<spage>9</spage>
<epage>12</epage>
<dateofissued>1995-12-30</dateofissued>
</meta>
</metadata>
```

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Acknowledgement

This work is supported by SPARC Japan, Cyber Science Infrastructure project, NII and based on the results of 21st COE program "Mathematics of Nonlinear structures via Singularity".