

## **Music Research in the Digital Age: IAML-IMS Plenary Session**

### **Remarks: Laurent Pugin**

My point of view in this discussion is probably more technological than that of my colleagues here. I certainly have no intention of covering all the topics brought up in the abstract for the session, but rather to put forward a couple of aspects that seem important to me from this more technological point of view, and, more precisely, looking at the creation of resources.

For the last ten years or so, I have been participating in musicology conferences, and I have attended most IAML meetings, as many of you here. But in addition, I have been involved in Music Information Retrieval, known as MIR, and the International Society for Music Information Retrieval (ISMIR), a community you might be less familiar with.

### **MIR**

MIR research has emerged from the need to have dedicated algorithms, tools, and interfaces for processing, manipulating, and interacting with music data. And this is because music is special—we like to think so, but of course, it is absolutely true. Currently, much of MIR research focuses on audio processing, but we should not forget that, at its beginning, it had a strong library component. The field was born around questions on processing music notation data (also known as symbolic music data) and metadata. Many of these questions remain open and are still actively covered at ISMIR.

One example of MIR research we can look at for our discussion today is incipit searching. The RISM incipits were used by a group of scholars for evaluating different algorithms for this task. For this evaluation, a set of so-called ground-truth data was defined by expert musicologists in order to see how good an algorithm would be and to compare them. Depending on the algorithm used, the ground-truth data might also have been used for training the system.

This is interesting for several reasons. The fact that the data produced within a bibliographical project is one of them. Having for MIR research about half a million transcribed music incipits was in a way big data before its time. But more interestingly, what we have seen coming out of the research highlights how difficult it is to define music

similarity and the limitations of an engineer-like evaluation. I do not question the quality of the research and of the ground-truth data here, but more the fact that in the end, what the end-user will expect to see varies considerably depending on one's musical interest (be it rhythm, pitch, metric, etc.), and that this variety needs to be taken into account.

We also face the issue that, because of the complexity of many of these algorithms, or because of their software dependencies, it is not always easy to go from the scientific experiments to something we can put into production in a sustainable way. So what can we do to change this?

First of all, we need to remain in touch with researchers in order to encourage them to make the output of their research usable in production. This is often difficult because the research projects are mainly limited in time, and not enough time can be devoted to documentation. But there is another point we need to keep making: we need to have dedicated systems and interfaces for music searching in order to be able to benefit from this type of research, from MIR research, and incipit searching is only one example.

(In this respect, I was quite happy to see during the presentation on Monday the success of the New York Philharmonic archives in the development of a in-house solution based on an existing open-source platform.)

## **MEC**

ISMIR is not the only place where interesting digital developments relevant to us are discussed and presented. Last month in Florence, we had our third Music Encoding Conference organized by the Music Encoding Initiative, or MEI. With a bit less than one hundred participants, it is a fairly small event, but it has this particularity, I think, to be an event that creates links across communities. There were participants from the three research communities I have mentioned: IMS – IAML – ISMIR, but also music publishers. Why does this happen? Why would people be interested in music encoding, and in MEI in particular, whose aims are to discuss and define a common way of encoding music data? Is this so important?

I guess the answer is the need for both modularity and standardization. In a way, we can say that the two concepts are at the core of the design of MEI. I will not present MEI completely here, but define it in a few words: MEI is a modular XML schema for music encoding that can cover a wide range of applications. It includes a very rich metadata

header, modules for several music notation types, for critical editing or for music analysis, only to mention some of them.

## **Modularity**

MEI is primarily targeting musicological applications, as you might have seen during our session yesterday. But thanks to its modularity, it is also successfully used in library projects, such as in thematic catalogues. This clearly demonstrates the strength of its modular approach. Each project can use MEI according to its own needs, or even extend it if necessary, but everything that is common is identical and can be shared easily. In the same way, tools to manipulate the data can also be shared and we can see in the MEI community software components being reused in a very different environment. To come back to the incipits, we have developed a visualization solution that can serve other purposes as long as the underlying data is also in MEI.

## **Conclusion**

To conclude, I would say that I would like to see technology used as a way to link not only data but also communities. Linking data, as in Linked Open Data of course, reinforces the need for strong authoritative data sources. We still need high quality data sources and I can see the Linked Open Data world as a second phase for bibliographic projects. This does not mean we cannot rethink the way data are collected, but their necessity remains undebatable, maybe even now more than ever.

Linking communities, as we can see it happening with the Music Encoding Initiative, makes it possible to share data and tools in a much easier way. This is true and important not only for open-data and open-source projects, but also for commercial ventures because what everybody wants to have in the long run is data that remain separated from the tools and on which people will be able to build in the future.