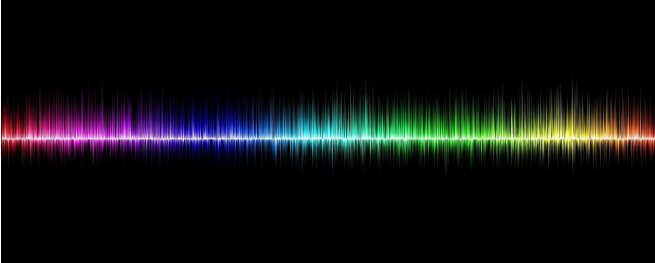


Optical music recognition with convolutional neural network

24 June 2021, by David Bradley



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Optical character recognition (OCR) commonly used to convert the text in scanned documents into a searchable and editable form on the computer is a well-established digitisation technique. But, what about other kinds of documents, rich with meaning, such as musical manuscripts? New work in the *International Journal of Arts and Technology* discusses the possibility of optical musical recognition, OMR.

A new approach developed by a team at Bina Nusantara University in Jakarta, Indonesia, uses deep machine learning and a convolutional neural network trained to recognize the nuance of musical notation on known [manuscripts](#). The algorithm can then convert a newly presented musical manuscript into a digitized form with 8 percent accuracy. Even at this level, this greatly reduces the amount of manual input and correction needed to convert a manuscript.

The system requires clef, stave, and musical key to be in position, but these are easily assigned in a template. The conversion of a scanned manuscript then detects the position on the stave of each note, thus defining pitch. The next step will be to use a parallel algorithm to detect the duration of each note and to identify the position of silences, rests, and other such characteristics of a manuscript.

Once fully digitized it is, given current software, a trivial matter to use the computer to "play" the manuscript using all manner of instrumental sounds or even to correlate a lyrical score with the music and have the computer "sing" the song. OMR, once mature, will have many applications in archiving musical manuscripts, in the performance of music, and in [music education](#). The team suggests that their approach could allow software "app" developers to write a program for smartphone or tablet to allow anyone to quickly scan a piece of sheet music, for instance, and to carry out OMR on that manuscript.

Of course, while music digitization tools could be enabling for a wide range of people interested in [music](#), there is still the question of musical talent. There is, unfortunately, no app for that.

More information: N.A. Andrea et al, Music note position recognition in optical music recognition using convolutional neural network, *International Journal of Arts and Technology* (2021). [DOI: 10.1504/IJART.2021.115764](https://doi.org/10.1504/IJART.2021.115764)

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