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STEINBERG R&D

Music RAI Workshop - 17 July 2024

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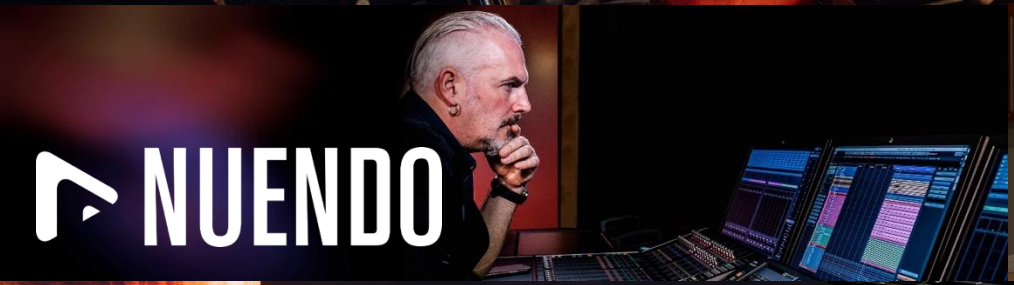
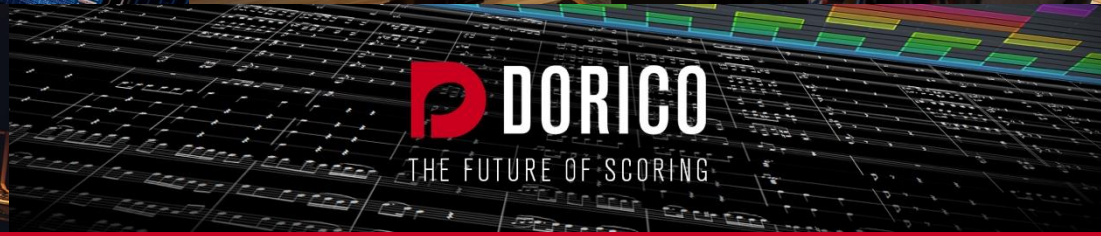
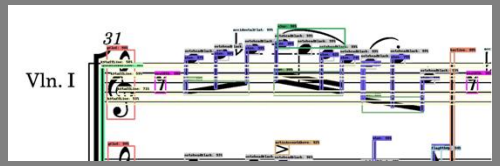




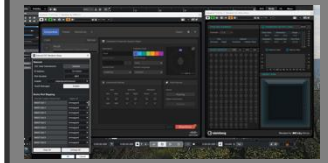
Examples of Research Themes

Optical Music Recognition



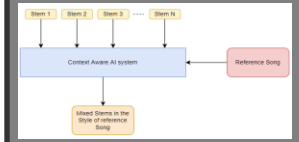
With help of AI, convert picture of a music sheet into semantic and structural representation like MusicXML for Dorico.

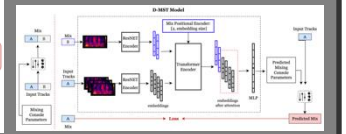
3D Audio Support in Plugins



Provide DSP technologies for 3D audio plug-in and workflow integration in DAW for immersive production

Mix Style Transfer



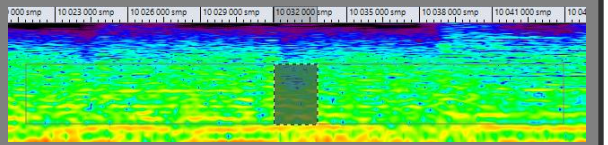


Collaborate with an Automatic Mixing AI as if it was a Mixing Engineer

Music Generation

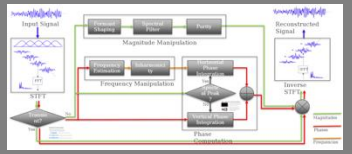
A Co-creative AI System for Music Composition in Cubase

Audio Restoration



Improve the audio quality of your recording

Time Stretching & Pitch Shifting



Best Time Stretching & Pitch Shifting quality for audio synthesis in HALion

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OMR Research – QMUL / Steinberg

- Shatri, Elona, Timms, Benjamin and György Fazekas. ***“Instance Segmentation in Optical Music Recognition”*** in 2023 TISMIR journal. (Acceptance awaiting).
- Walwadkar, Dnyanesh, Shatri, Elona, Timms, Benjamin and György Fazekas.
  “*CompIdNet: Sheet Music Composer Identification using Deep Neural Network*” at the International Workshop for Reading Music Systems WoRMS 2022
- Shatri, Elona, and György Fazekas.
  “***Optical music recognition: State of the art and major challenges.”***
  at TENOR2020/21, arXiv preprint arXiv:2006.07885 (2020).
- Shatri, Elona, and György Fazekas.
  "DoReMi: First glance at a universal OMR dataset”
  at the International Workshop for Reading Music Systems WoRMS 2021, arXiv preprint arXiv:2107.07786 (2021).
- Pranjali Hande, Elona Shatri, Benjamin Timms, György Fazekas
  *“**Towards Artificially Generated Handwritten Sheet Music Datasets”*** 5th WoRMS. 2023.
- Zhang, Zihui, Elona Shatri, and György Fazekas.
  "Improving Sheet Music Recognition using Data Augmentation and Image Enhancement." 5th WoRMS. 2023.
- Calvo-Zaragoza, Jorge, Alexander Pacha, and Elona Shatri.
  "Proceedings of the 5th International Workshop on Reading Music Systems." arXiv preprint arXiv:2311.04091 (2023).
- Calvo-Zaragoza, Jorge, Alexander Pacha, and Elona Shatri.
  "Proceedings of the 4th International Workshop on Reading Music Systems." arXiv preprint arXiv:2211.13285 (2022).
- Elona Shatri, George Fazekas. ***“Knowledge Discovery in Optical Music Recognition: Enhancing Information Retrieval with Instance Segmentation”***

Case Study: DoReMI data set

Specific challenges:

- Comparatively small data sets compared to audio world
- Class imbalances in music notation
- Limitations on using copyrighted materials
- Bias towards older eras of conventional western music notation

Case Study: Tabla OMR Concept

Specific challenges:

- Masters student project idea focussing on OMR for Indian tabla drums which couldn’t get started
- Challenges around accessing data sets with standardised representations
- Support for Tabla notation in software (Dorico)
- Challenges in accessing communities
- Needs every part in the chain to be in place

Steinberg's Role in Responsible AI

* terms and conditions apply

- Compliance with EU AI Act
- Building data sets based on customer need
- Commercial focus naturally leads to bias towards western music
- In (currently) less commercial markets, work with academic community and regional innovators
- Aim to make tools as open and flexible as possible