# Charles Matthews, PhD

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Technical audio designer specialising in UE and Wwise, with over 20 years of experience developing interactive media.

## Skills

**Programming languages:**  C++, C#, Python, JavaScript, Java

**Game engines and tools:** Unreal Engine (Blueprints, C++), Unity, Blender.

**Audio and middleware:** MetaSounds (C++ plugin development), Wwise, Max/MSP, Pure Data, Web Audio API

**Audio production:** Ableton, ProTools, Reaper, analog and digital studios, synthesis, foley, scripting

**+** R&D, project management (GitHub, Trello, Jira), asset management, version control (Git), training and documentation

## Project Experience

**Independent audio developer /  technical audio designer,** 06/2024 - current

- Developed plugins for music and sound design, including a library of new MetaSound nodes for Unreal Engine.
- Currently working on the sound design and implementation for a forthcoming indie horror title (*The Transitions*, by *Unfathomable Studio*): ambience, foley, dynamic footstep and reverb systems, and UI sounds.

**Lead audio developer and researcher**, 11/2020 – current

**Blurring the Boundaries Arts Inc. (not for profit)**, Montréal QC

- Worked with dancers and artists to design and implement audio triggers from sensors and live motion capture.
- Developed musical web apps and code libraries using Web Audio, Serial, MIDI, Socket, and YouTube APIs.
- Developed an audio graph editor/synthesiser for the web and a Pure Data library for interactive music.

**Lead developer / audio designer**, 01/2021 – 04/2024

**Good Vibrations (music charity)**, London UK

- Created a GarageBand-style web app (*Gamelan Room*) from initial concept to public release, currently in use for public workshops and within the UK prison system, and including a prototype online multiplayer mode.
- Prepared samples for 15 musical instruments, implementing dynamic mix, sequencer, and accessibility options.
- Modelled instruments in Blender and optimised export and integration workflows through Python scripting.
- Optimised latency and reduced size from 400MB to 50MB for the shipped version, maintaining AV quality.

**Lead developer**, 06/2018 – 04/2022

**Human Instruments**, London UK

- Developed a prototype and shipped a small run of performance-ready devices to track the movements of a conductor's baton and send wireless haptic feedback to performers; featured on BBC and CNN.
- Consulted musicians, designers and other stakeholders to refine the  vibration patterns and user interfaces, including remote technical support and firmware updates for non-specialists.
- Wrote extensive technical documentation and provided consultation for a patent application.

**Audio developer and accessibility trainer**, 06/2015 – 07/2020

**Drake Music Ltd.** (music charity), London UK

- Developed accessible musical instruments through collaborative design, using C++ and Pure Data embedded on custom boards to link live motion capture to sound.
- Delivered sound design and implementation for outdoor installations and educational projects.
- Collaborated with educators to devise strategies and workflows for integrating music technology into special education settings, creating adaptive interfaces and apps to bridge with specialist hardware where required.

**Part-time Lecturer (sound design, interactive technology and sound art)**, 10/2014 - 07/2020

**Middlesex University**, London UK | **City Literary Institute**, London UK

- Taught classes on sound design and programming, synthesis, electroacoustic composition, and foley/FX.

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## Training and certification

**Wwise 251: Performance Optimisation and Mobile Considerations Certificate** (online), 11/2024
**Agile with Atlassian Jira Certificate** (online), 11/2024
**Wwise 101: Fundamentals Certificate** (online), 10/2024

**Ministère de l'Immigration, de la Francisation et de l'Intégration,** Montréal QC
- **Francisation niveau 8**, 10/2024 – current

**Musician's Institute**, Tokyo JP
- **RIT Sound Engineering Certificate**, 07/1999

## Education

**Middlesex University**, London UK
- **PhD in Music**, 10/2014
  - Thesis: combining traditional Javanese music theory with electronic composition.
  - Research published in *Oxford Handbook of Algorithmic Music* (Oxford University Press, 2018).
- **MA in Sonic Arts**, 01/2009
  - Technical focus: procedural music system developed using Java and Max/MSP.
- **BA in Sonic Arts**, 07/2004
  - Sound design and musique concrète, interactive performance systems.