GLOBAL INTERNSHIP PROGRAM 2024
Research and Development Division in Hamamatsu Japan

INTERNSHIP

Yamaha Corporation is recruiting a wide range of competitive R&D engineers for its internship programs. Interns will be working at the Innovation Center, which is Yamaha's dedicated R&D headquarters located in Hamamatsu Japan. The program will span approximately 12 weeks in 2024 summer season and will support your travel and accommodations in case of working at Yamaha. Interns will be members of teams which include other Yamaha researchers and engineers.

WHO WE ARE

With over 130 years of proud history, Yamaha Corporation is the largest and most dynamic manufacturer of acoustic and digital musical instruments and professional audio products in the world.

ABOUT RECRUITMENT

Doctoral or master's students in engineering, computer science, and/or mathematics. Apply for our research internship and enjoy your stay in Japan's city of music!

Please visit our website for more information on our Global Internship Program.
www.yamaha.com/en/recruitment/internship/

AI-powered solo detection for musical instruments

Mixing engineers perform a variety of tasks depending on different situations during a live performance. Therefore, it is important to understand the situations that can occur during a live performance in order to develop a mixing console that can assist engineers. Detection of solo sections is a particularly important issue for this context. In this internship, as a member of a team dealing with machine learning and audio signal processing, the intern will be expected to develop a technology for detecting solo sections from the input, mainly based on machine learning technology. The intern will also be expected to perform more advanced tasks, such as identifying not only solo sections, but also other sections of a live performance at the same time.

Required: Expertise in programming (Python, C++), audio signal processing, and machine learning
Welcomed: Experience in playing musical instruments or mixing

Sound field reproduction of musical instrumentals when performing

Even in a virtual space, unique radiation characteristics might be required when performing musical instruments. This could contribute to the "reality of the musical performance". In this internship, as a member of a team dealing with audio signal processing and spatial audio, the intern will be expected to use multiple ViReal Mics to develop a method for the measurement of the radiation characteristics of musical instrumentals when performing, and to evaluate the developed method in a real environment. The intern will also be expected to model the recorded source as objects with directivity to auralize through binaural reproduction.

Required: Expertise in sound field theory in the spherical harmonic domain, array signal processing, and programming (Python, MATLAB)
Welcomed: Experience in sound field recording and the measurement of radiation characteristics

Immersive Virtual Backgrounds for EnhancedRemote Communication with 3D audio production

Traditional virtual backgrounds used in remote communication lack naturalness, remaining static even when there is camera movement. Additionally, the acoustic characteristics of various environments are not simulated accurately. In this internship, you will have the opportunity to develop 3D rendering techniques for dynamically adapting virtual backgrounds to camera movements. Furthermore, the task includes context-driven virtual room acoustics such as the speaker's voice enhancement. Our goal is to create software that revolutionizes remote communication by delivering more realistic virtual backgrounds and immersive audio experiences, raising the bar for industry standards.

Required: Proficiency in programming languages such as Python and C++
Welcomed: Experience in audio signal processing, computer vision, and image processing

AI-powered agent for music ensemble

Understanding and generating a music performance with a computer enables a wide variety of applications that add value to the experience of playing a musical instrument. In this internship, we will work on machine learning techniques related to music performance and/or motion generation or recognition, for the purpose of providing an interactive music performance agent. We will provide two tracks for this internship:
(1) The intern will be expected to apply machine learning to create an interactive virtual musician.
(2) The intern will be expected to create an interactive virtual musician system for a music ensemble.

(1) Required: Expertise in programming (Python, C++), music information retrieval, and machine learning
Welcomed: Expertise in human-computer interaction, experience in handling human motion data (e.g. BVH data)

(2) Required: Experience in creating interactive systems (experience in languages e.g., Max/MSP/Jitter, TouchDesigner, Unity, UE, HTML+JS), experience with machine learning frameworks (e.g. torch, TF, CoreML)
Welcomed: Expertise in human-computer interaction or music informatics research, knowledge of character animation, experience in creating VR/XR systems

Psychophysical modeling of the auditory spatial impression in the context of musical instruments and audio equipment

At Yamaha, we consider two factors when seeking to achieve high-quality sound through the research and development of musical instruments and audio equipment: tone quality or timbre, and the spatial features of sound. The way humans form an "auditory spatial impression" from such spatial features is an active topic of research with many open questions. During this internship, you will formulate new psychophysical models of the auditory spatial impression of musical instruments and audio equipment. To this end, you will gather sensory data from psychophysical experiments, and apply data analysis techniques to identify the physical features of sound sources and fields that can best explain the experimental results.
The main tasks of this internship include the following:
· Design and planning of sensory evaluation experiments
· Data collection from psychophysical experiments and physical measurements of spatial acoustics.
· Comprehensive analysis of sensory data and physical measurements

Required: Knowledge of statistics and data analysis, expertise in Python programming
Welcomed: Knowledge of physical acoustics, psychophysics and array signal processing