RAISE Center of Excellence

Towards Personalized Hearing in Virtual Environments using AI Techniques

AI and Simulation Based Engineering Workshop

Prague, CZ
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Simulation and Data Lab Acoustic and Tactile Engineering

IHPC National Competence Center for HPC & AI in Iceland

Acoustic and Tactile Engineering

General information

The focus of the Acoustic and Tactile Engineering (ACUTE) lab is both on research and product development. For the last few years, our main focus has been on the development of wearable assistive devices for visually impaired persons and cochlear implant recipients. We are also working on other projects, such as solutions for delivering virtual acoustics (i.e., sounds generated by computers) as realistically as possible and on multi-channel recording/playback.

Some of our current collaborations include; Oticon Medical, DTU (Technical University of Denmark), University of Southampton and Treble technologies.

Dr. Ing. Finnur Pind

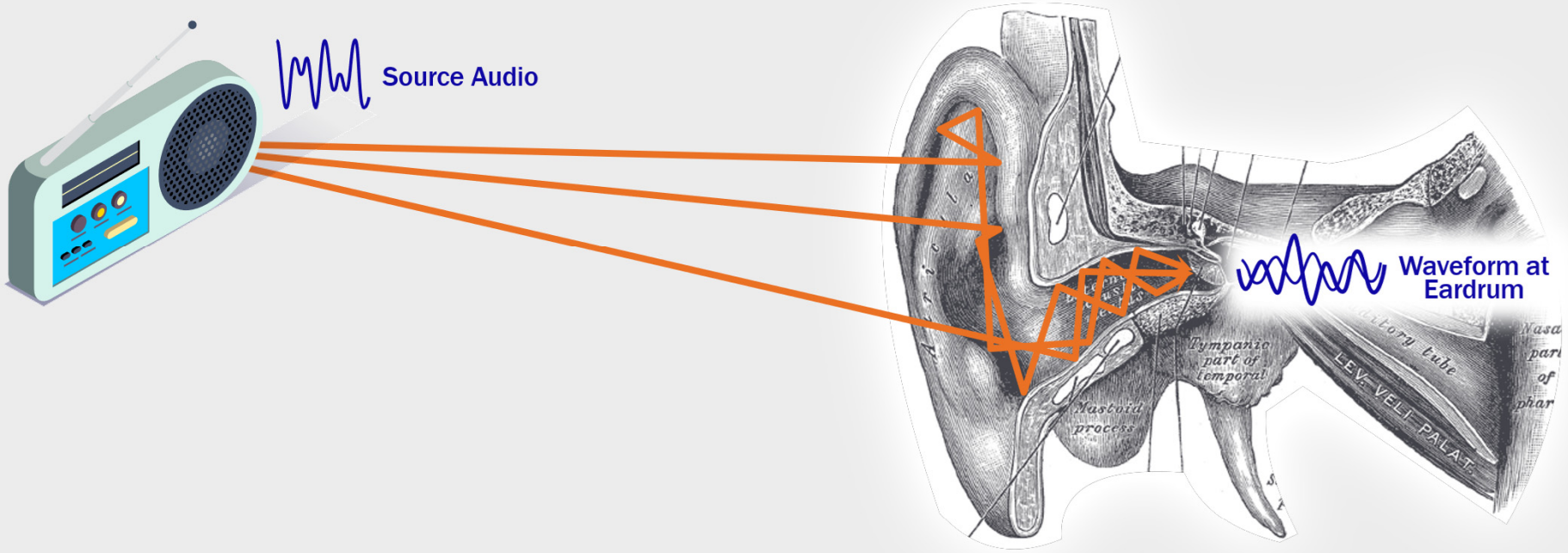
Dr. Finnur Pind received his MSc in acoustical engineering in 2013 from the Technical University of Denmark (DTU), and his PhD from the same institution in 2020. His PhD research was centered on virtual acoustics and was done in collaboration with the architectural studio Henning Larsen. Between his MSc and PhD studies, Finnur was an acoustic consultant in the building industry for some three years, and before entering the world of acoustics he was a software engineer in the telecom industry. His research interests include wave-based (numerical) acoustic simulations, acoustic virtual reality, room surface modeling, high-performance computing and spatial audio. He is currently a postdoctoral researcher at the ACUTE (Acoustics and Tactile Engineering) group at the University of Iceland and co-founder / CEO of Treble Technologies, which develops state-of-the-art virtual acoustics software.

Prof. Dr. Ing Rúnar Unnþórsson

Dr. Runar Unnthorsson is a Professor (100%) at the faculty of Industrial engineering, Mechanical engineering, and Computer Science at the University of Iceland. Rúnar's main research interests are in performance engineering and the engineering application of acoustics / vibrations for sensory substitution, non-destructive evaluations, tactile/acoustic displays and product design.

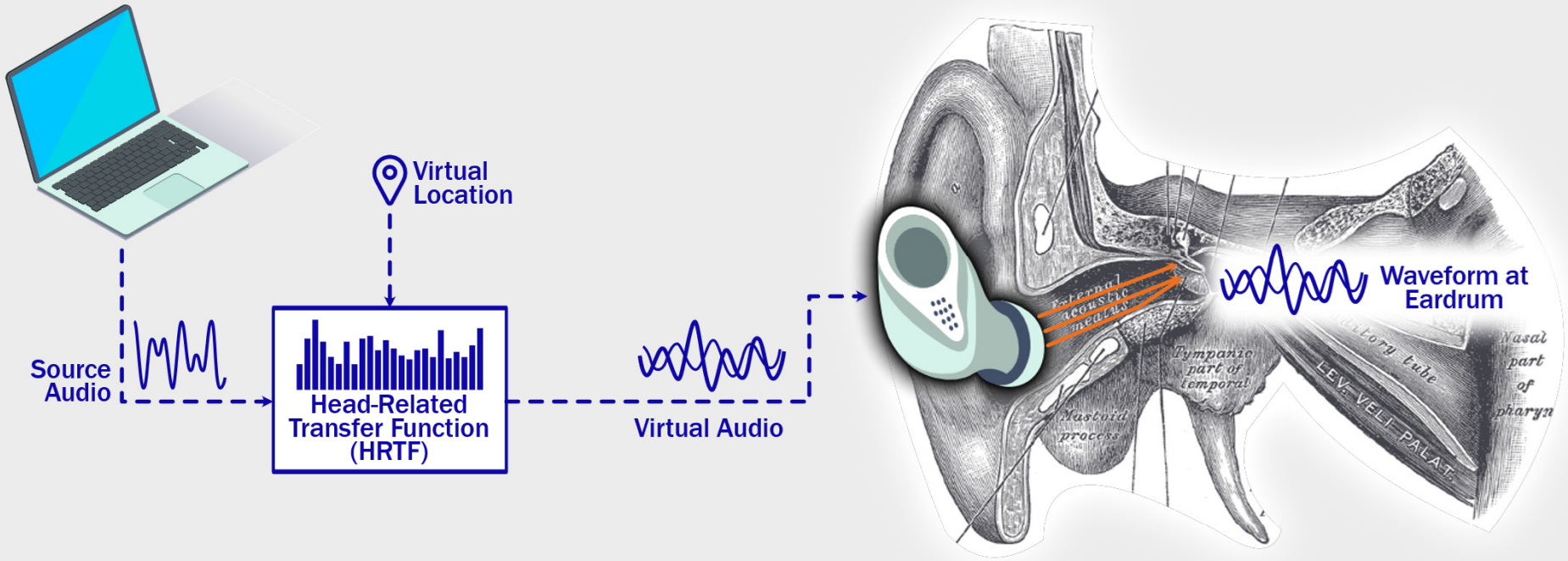
Prof. Runar Unnthorsson, coordinated the 4M€ H2020 RIA project Sound of Vision (no. 643636) which was carried out in the years 2015-2017. The project received the EC's 2018 Innovation Radar Prize in the category Tech for Society for the development of an assistive device for the visually impaired. In 2017, the lab was awarded the 2nd prize for its tactile display at the University of Iceland's Science and Innovation Awards. The ACUTE lab is currently working on the development of the tactile display – with support from the Technology Development Fund (tths.is)

Listening to the Natural Environment



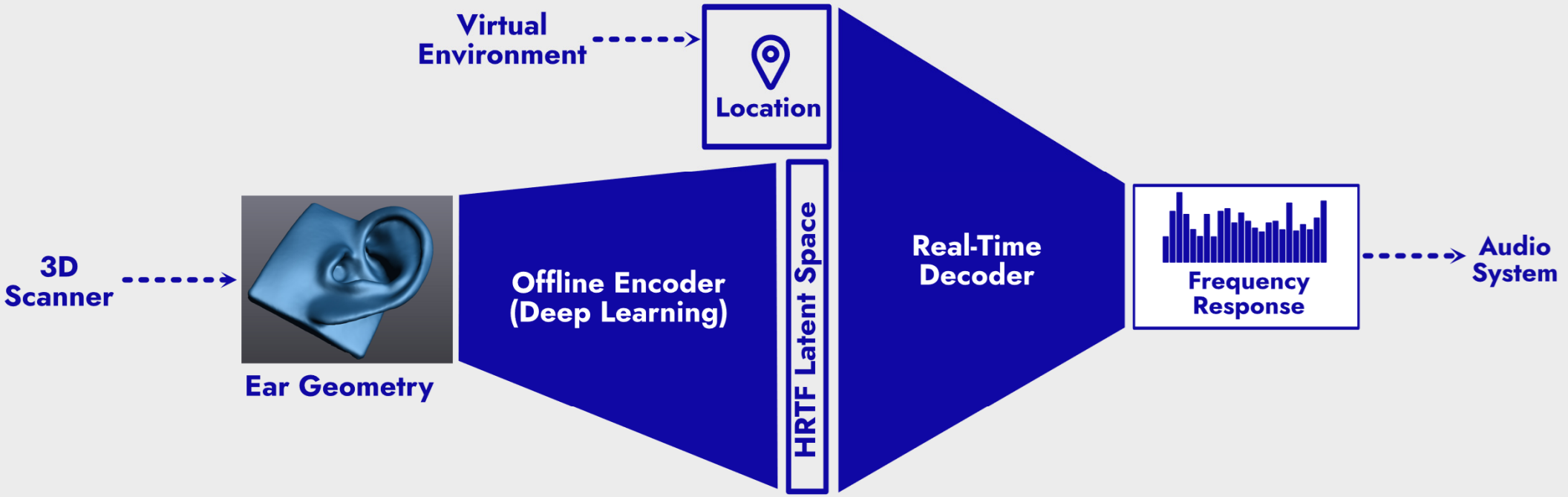
Gray's Anatomy (1918), Plate 907 (modified)

Listening to a Virtual Environment

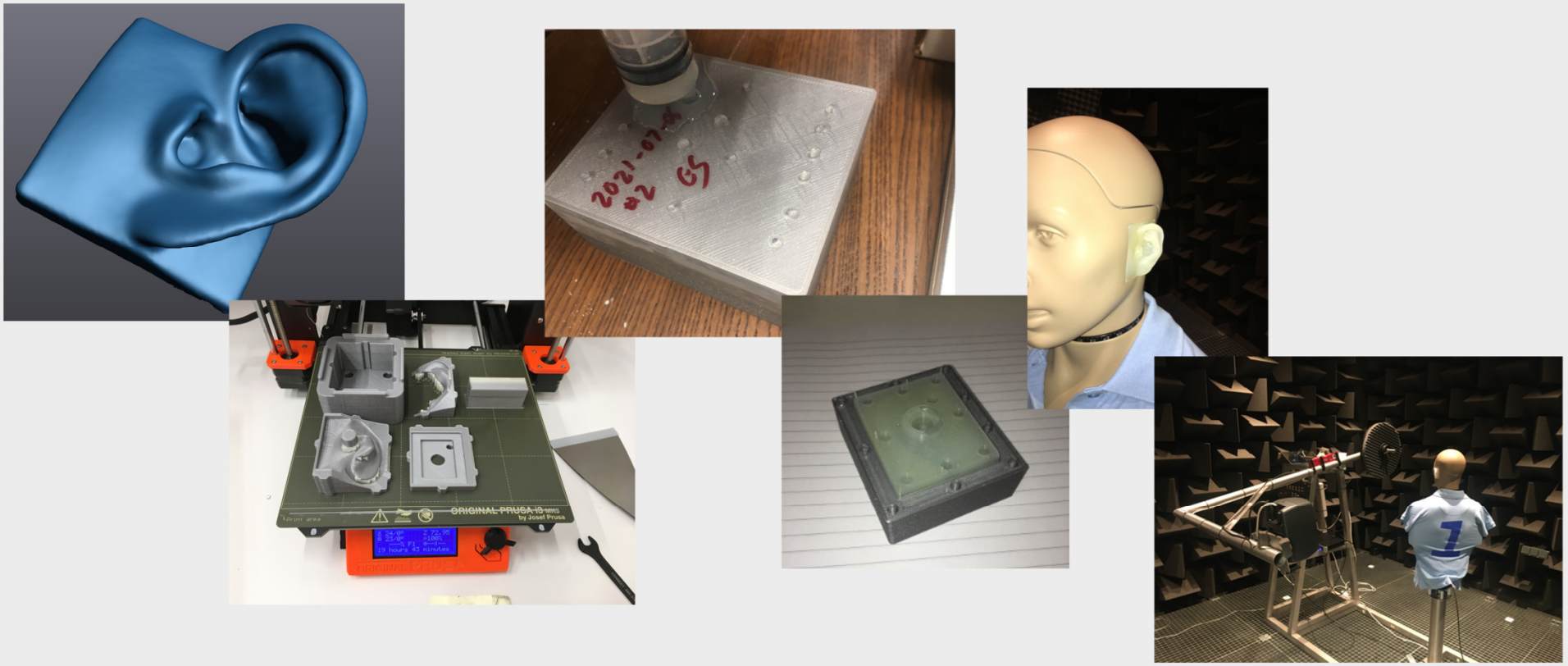


Gray's Anatomy (1918), Plate 907 (modified)

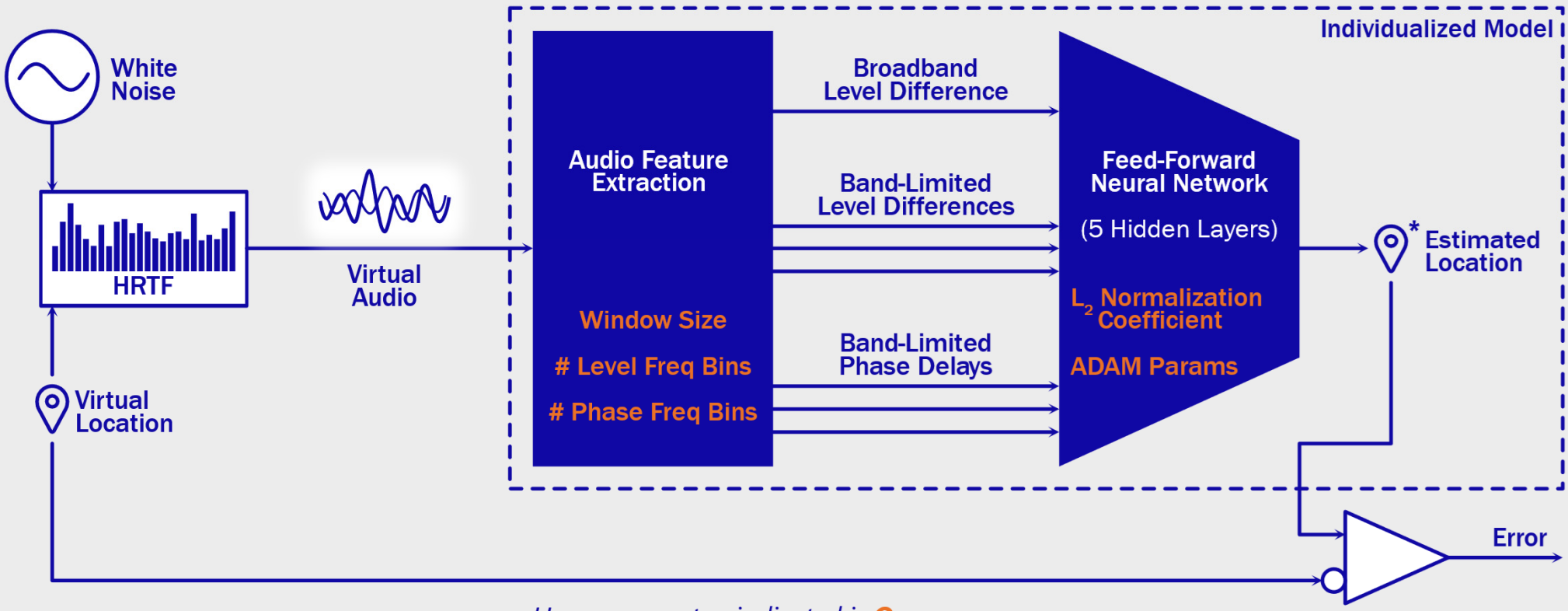
Target Architecture



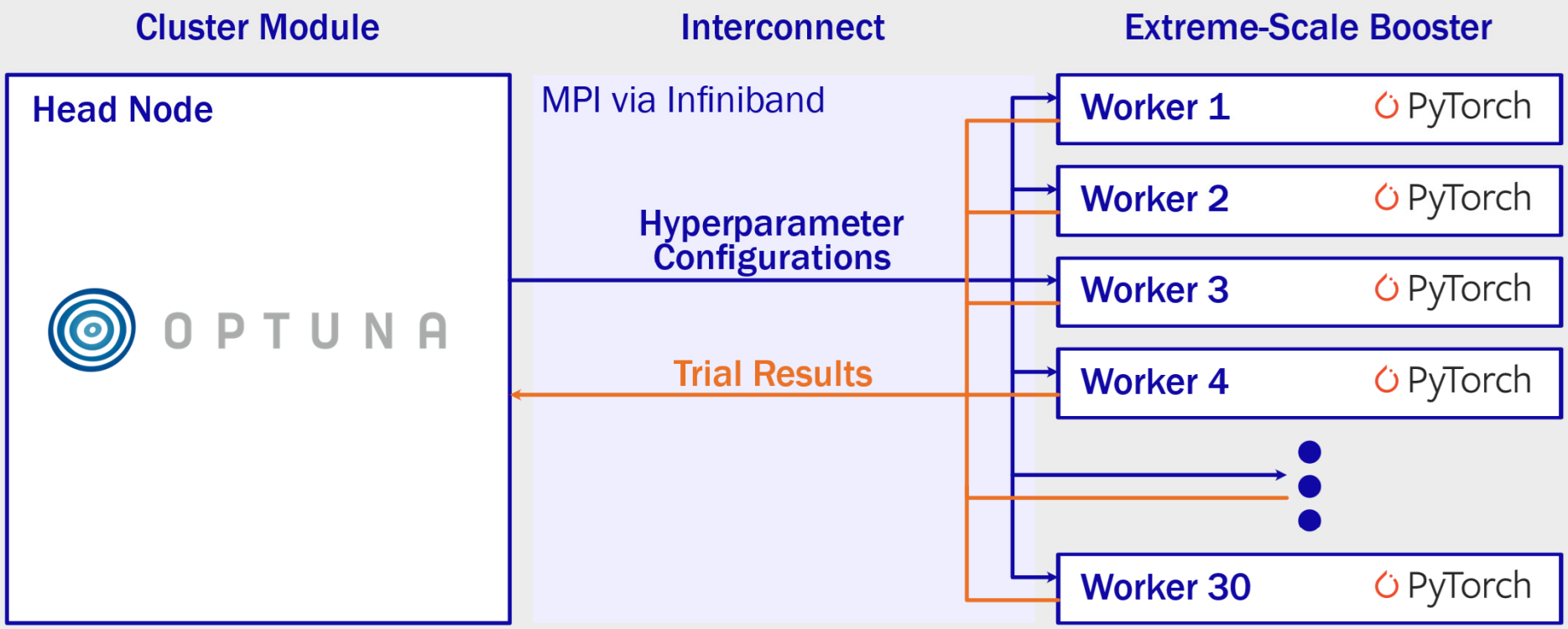
Training Data Collection



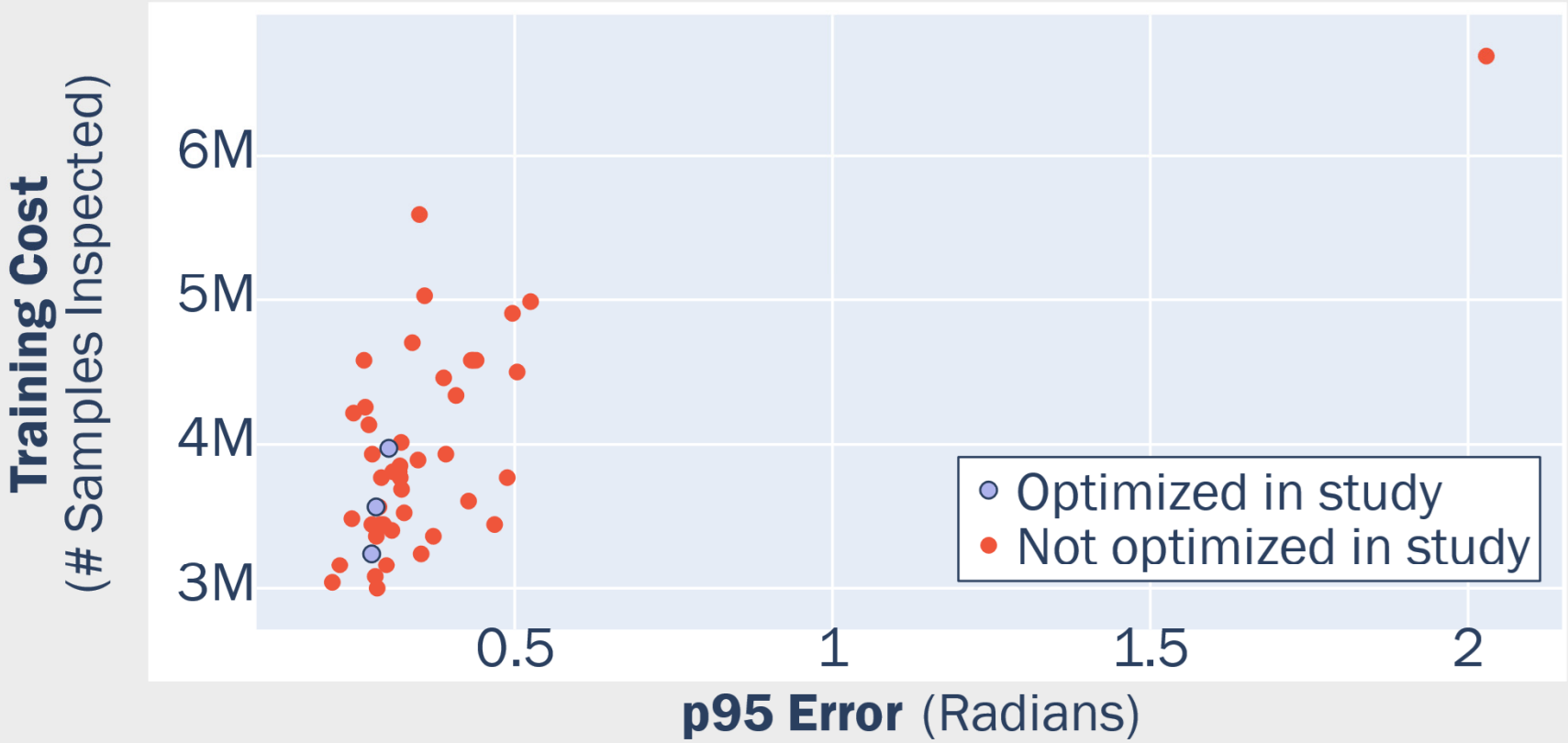
Model 1: Replicating L ocalization



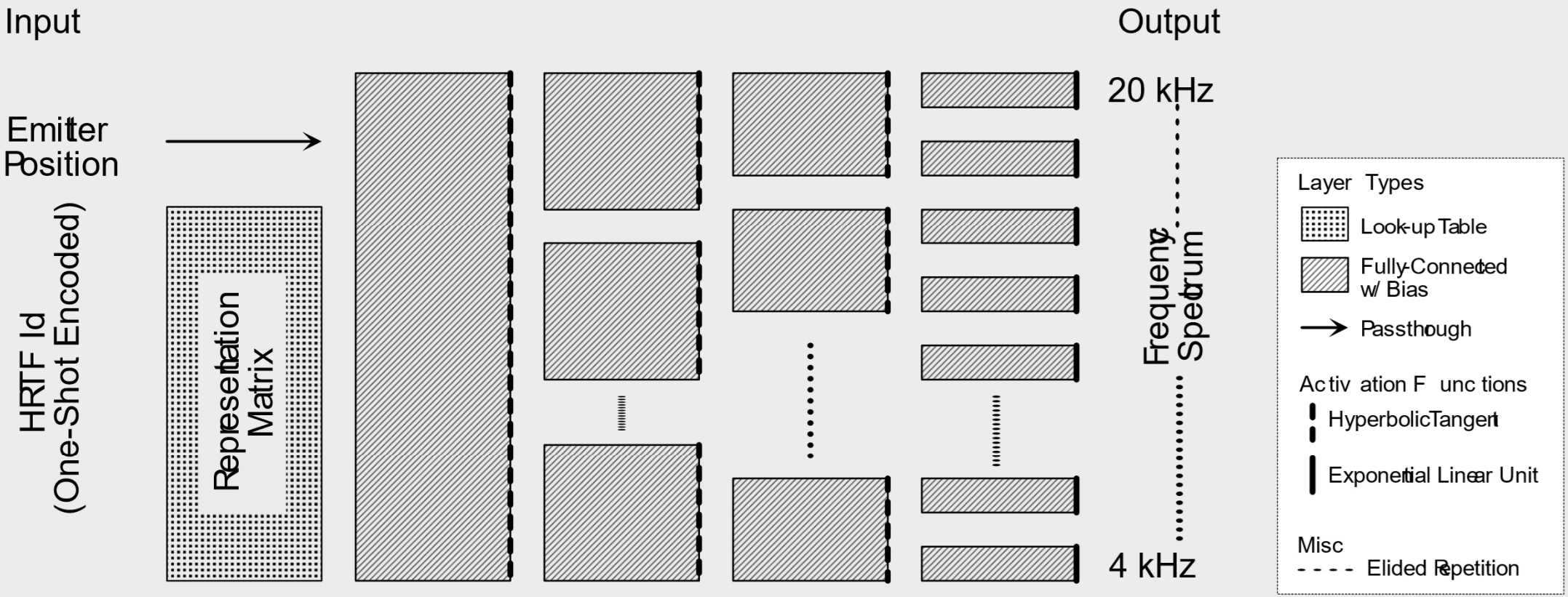
Model 1: Hyper paramet er Optimization



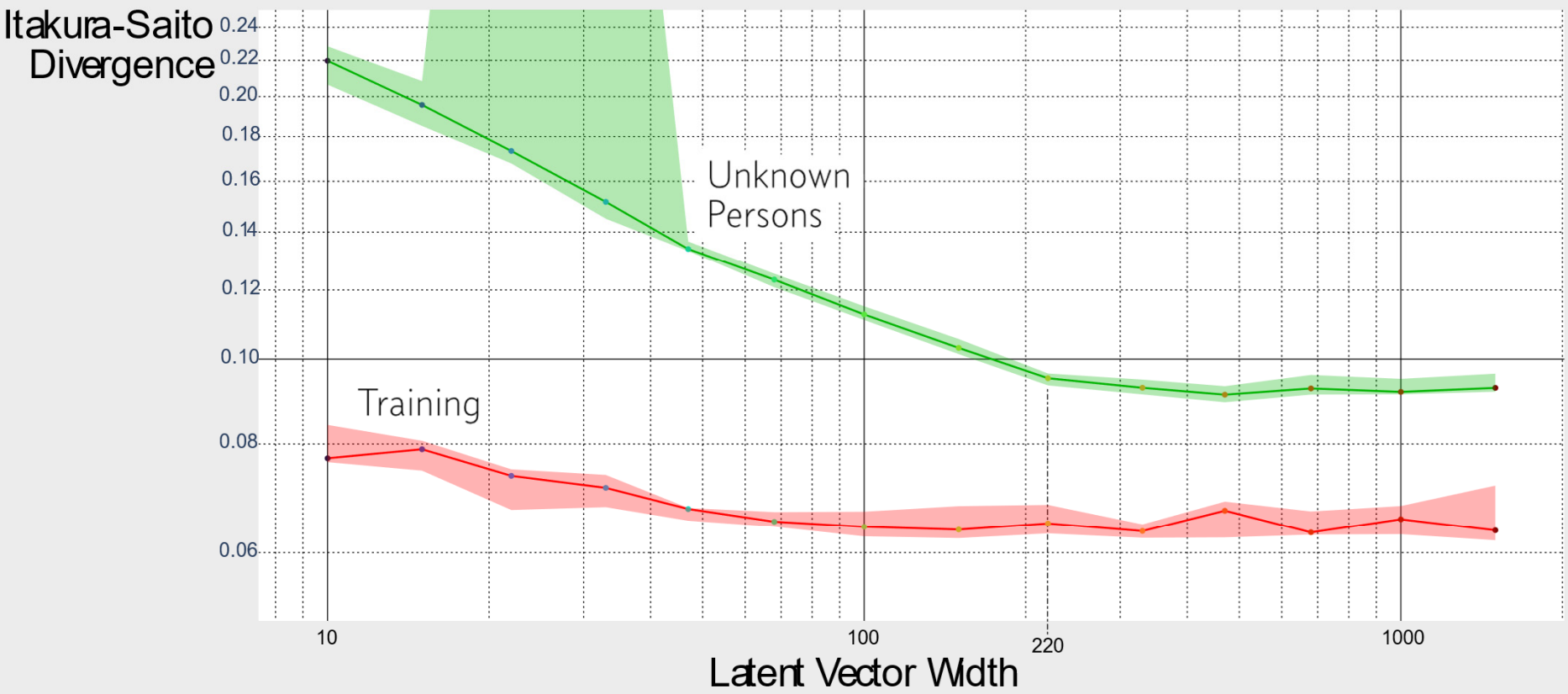
Model 1: Optimization R esults



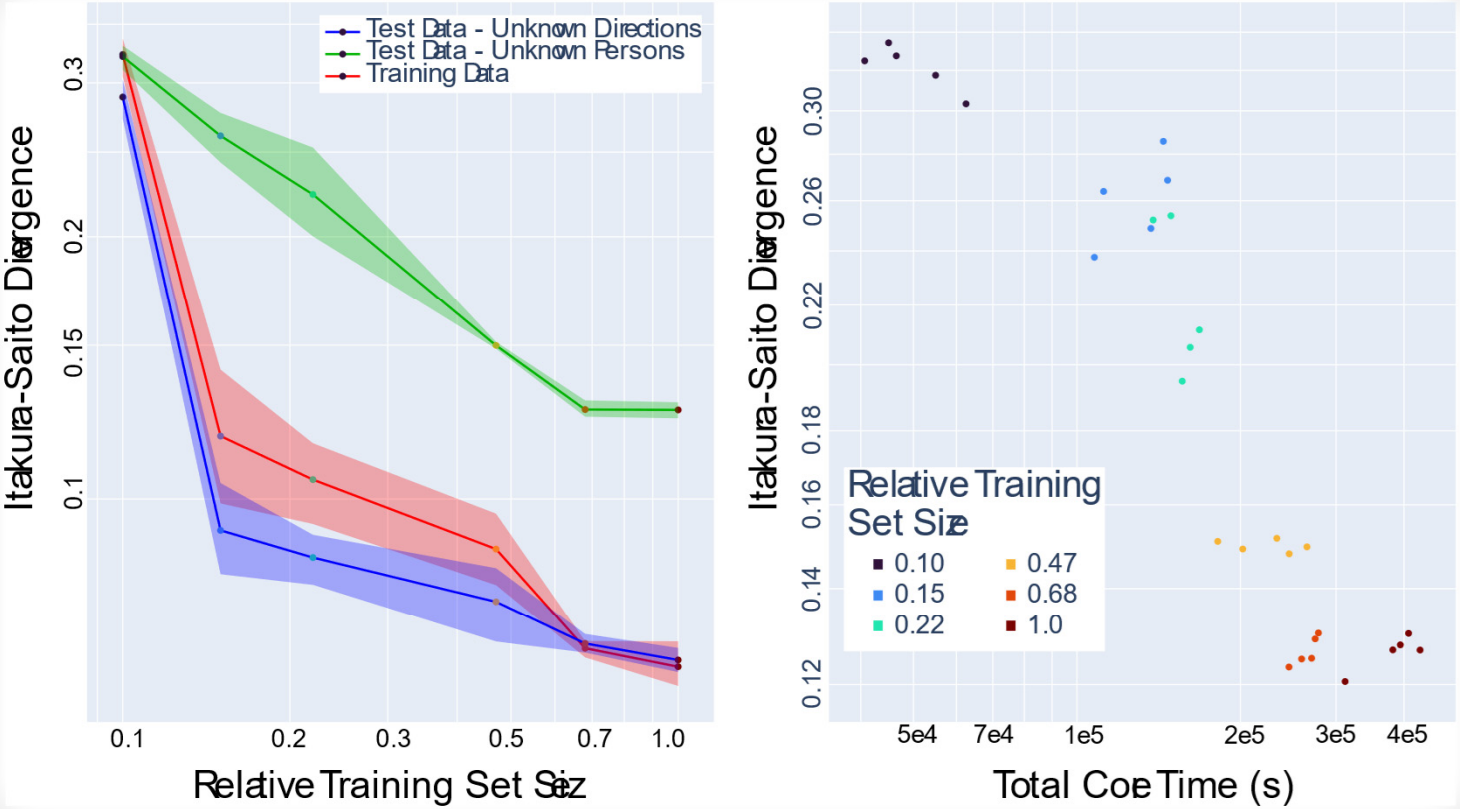
Model 2: Decoder Prototype



Model 2: Latent Space Dimensionality Study



Model 2: Scaling S tudy



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