Beyond Kalman Neural Network-controlled Smart Digital Filters

Cover letter for application to the project:
Neural network-controlled smart digital filters for audio processing.

Candidate name:
Yarib Israel Nevárez Esparza

January 2, 2022

Dear selection committee,

With this letter, I express my interest in the **PhD position on smart digital filters for audio processing** at the Eindhoven University of Technology.

I am a bursary PhD student at Universität Bremen (Germany), my dissertation is **Deep Neural Network Accelerators Based on Approximation Techniques for Energy-Efficient Industrial Internet-of-Things**. I am in the final stage of my PhD.

I have worked on low-power hardware design methodologies for machine learning algorithms on embedded FPGAs. Until now, my contribution is in approximation techniques for floating-point computation on artificial neural networks. This serves in applications for low-power near-sensor data analytics.

Moreover, an intrinsic interest in the field of embedded systems and hardware design for machine learning applications and digital signal processing motivates me to continue researching in this discipline. My goal is to contribute to this field for the benefit of society and scientific community. I personally think that defending two doctoral dissertations would enrich my academic skills to make a higher impact on contributions. For my personal development, this plan complements a bursary PhD with an employee PhD alternative.

Potentially, this would promote a research connection between the Eindhoven University of Technology and Universität Bremen, which would benefit research outcomes. **Fig.** 1 presents a tentative high-level overview.

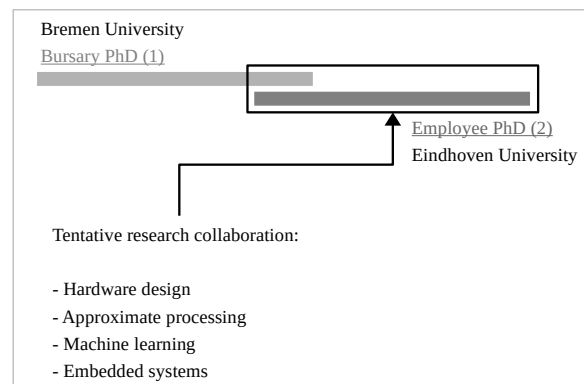Thank you for your time and consideration on this application. I look forward to your kind response.

Figure 1: High-level overview PhD.