

# Nitthilan Kannappan Jayakodi PhD AI/ML

*Curriculum Vitae*

School of Electrical Engineering and Computer science  
Washington state University

[Website/](#) [LinkedIn](#) / [Scholar](#)  
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PhD AI/ML. 12+ yrs R&D experience. Developed an adaptive hardware software co-design framework for emerging energy-efficient edge AI applications (robotics, AR/VR) for deep models from classification to synthesis of images and 3D shapes. Published 6+ papers at AAAI, DAC, DATE, ICCAD, IEEE TCAD/TECS

## PUBLICATIONS/GRANTS/PATENTS ([Google Scholar](#)) ([Thesis](#))

- **A Hardware Software Co-Design Framework for Energy-Efficient Edge AI** *ICCAD, 2021.*
- **Active Anomaly Detection via Ensembles** *JAIR, 2020.* Under Review.
- **Uncertainty-Aware Search Framework for Multi-Objective BO** *AAAI, 2020.* (20.6%)
- **SETGAN: Scale/Energy Trade-off GANs for Image Apps. on Mobiles.** *ICCAD, 2020.* (23.9%)
- **PETNet: Polycount/Energy Trade-off Nets for 3D Objects from Images.** *DAC, 2020.*(21%)
- **Design/Optimization of Energy/Accuracy Trade-Off Nets for Mobiles** *ACM TECS, 2020.*
- **GRAMARCH: A GPU-ReRAM based Heterogeneous Architecture for Neural Image Segmentation.** *DATE, 2020.* (23%) **Nominated for Best Paper Award**
- **MOOS: A Multi-Obj Design Space Exploration/Opt Framework for NoC.** *ACM TECS, 2019.*
- **Trading-off Accuracy/Energy of Deep Inference on Embedded Systems** *IEEE TCAD, 2018.*
- Contributed to grant **Small: Dynamic Resource Management in Hetero Mobile SoCs: Novel Algos and Efficient Deployment of Emerging Apps.** NSF, Core Program. \$500K (2020-23). Pending.
- U.S. Provisional Patent Application filed on August, 2020, entitled, **Heterogeneous GPU-RERAM Architecture for Neural Networks,**
- Conference and Journal Reviewer for IJCAI-2019, AAAI-2019, ESWEEK-2019, DAC-2020, AAAI-2020, IEEE TCAD 2019, 2020, ACM TODAES 2019, 2020, ACM TECS 2019. Volunteer for ICML 2019, Embedded Systems Week 2018

## PROFESSIONAL APPOINTMENTS ([Full Project List](#))

- **Research Assistant**, Washington State University, EECS Aug 2017 – Dec 2022
- **NeRF Volumetric Performance Capture Intern**, [Project Details](#)  
Sony Research and Development (3D Computer Graphics Group), June - Aug 2022
- **Deep Learning Research Scientist Intern**, [Project Details](#)  
Ampere Computing(OnSpectra acquired), July - Aug 2021
- **Senior Staff Engg. (Architect - Individual Contributor)**  
Polycom R&D, India May 2012 - Jun 2017
- **Lead and Senior Engineer, Media Processing (Led small team of 3-4 people)**  
Ittiam Systems, India Oct 2009 - Apr 2012
- **Senior Design/Dev. Engineer, Product R & D Engineering**  
Tata Elxsi, India Oct 2004 - Apr 2009
- **Teaching Assistant**, Washington State University, EECS Aug 2018 – May 2019  
CptS 437: Introduction to Machine Learning / CptS 315: Introduction to Data Mining

## EDUCATION

- **PhD AI/ML** Washington State University (GPA 3.95) Adv: Prof. Jana Doppa 2017 - 2022

- **BE, ECE** Anna Univ College of Engg Guindy (8.9 CGPA) *First class distinction* 2000 – 2004
- **12th/10th std**, DAV Mogappair 92.75% / 88% *Graduated with Excellence* 1998 – 2000
- **Relightable 3D Facial Performance Capture**: Targeting a facial performance capture system (in comparison to high end light-stage system) using depth (LiDAR/iPhone) based capture and neural rendering systems [DMTet, NvDiffRec]. Ability to capture relight-able [PBR/BRDF based] human performances and render them under different environments.
- **Multi-scale 3D Volumetric Performance Capture**: Ability to capture and store 3D volumetric video using NeRF based encoding [NeRF Studio, Instant-ngp, NSVF, KiloNeRF, HumanNeRF]. Improved inference PSNR by 3dB from ref HumanNeRF using multi-scale representation ([results](#))
- **Extracting full body 3D pose** from monocular video (YouTube, TikTok) using SMPLX prior (FrankMocap, SMPLify-X, VIBE). Improved MPJPE/MPVE score to that of ref VIBE using transformer models ([results](#))

#### PRODUCTS @ POLYCOM End-to-end Design, Development and Delivery

- **Video Conferencing plugin** for chrome 64 bit using PPAPI
- **RTP, RDP and HTML5 based Content Collaboration** between MCU, Lync and Browser endpoints
- Automation Platform for bringing up Infrastructure for **Video as a service on VMWare**
- **Platform Director**: Life cycle management of virtual instances on VMWare using viJava

#### PRODUCTS @ ITTIAM End-to-end Design, Development and Delivery

- Mpeg2 (MP@HL) HD(1080i@30fps) **Encoder/Transcoder for Broadcast** on Netra (IVAHD Accel)
- MPEG4 Simple Profile (SP) HD(720p@30fps) **Encoder for Smart Phones** on OMAP34xx (Arm+DSP+IVA)
- Mpeg4 SP D1 (480p@30fps) **Encoder for Portable Media Player and Recorder** on OMAP3430.

#### SKILLS

- DL Frameworks: PyTorch, Keras, Caffe, TensorFlow, Numpy
- C, C++, Java, Javascript, Torch, Lua, Python, Unix
- MPEG2, MPEG4, H264/5, H263, SVC, RTP, RTCP, RTSP, HLS, Ffmpeg, Gstreamer
- Web: WebRTC, Socketio, REST, MVC , Frontend (Angularjs, Html5, Threejs, Canvas), Backend (Nodejs, Spring, Apache)
- OpenCV, Android (libGDX, phonegap, ionic)
- Database: nosql, mongo, mongoose, postgres,
- Embedded: OMAP3430 (TI), IVA HD[OMAP4, Netra] (TI), ARM\*, ADSP 219x, INTEL MMX/SSE/SSE2

#### AWARDS AND HONORS

<b>Richard Newton Young Fellowship</b> , Special Interest Group on Design Automation	2020
<b>Selected to Present at DAC PhD Forum</b> , Design Automation Conference (DAC)	2020
<b>Three-Minute VCEA Thesis Competition</b> , Runner-Up, WSU	2020
<b>Harold and Diana Frank Electrical Engineering Fellowship</b> , WSU (Thrice)	2018 - 2020
<b>Suksdorf Fellowship</b> , WSU (Thrice)	2017-2019
<b>I-Corps/WESKA</b> , WSU Innovation Corps/Entrepreneurship program participant	2019