Nitthilan Kannappan Jayakodi PhD AI/ML   *Curriculum Vitae*

School of Electrical Engineering and Computer science   [Website](#)/ [LinkedIn](#) / [Scholar](#)
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PhD AI/ML Image/3D. 12+ yrs R&D experience. Passionate about video encoding algorithms optimizing across different applications for conferencing, broadcast, and storage. Built end to end systems from embedded to web technologies.Worked on ME/RC for H264/MPEG and developed plugin/webRTC/Html5 based video endpoints. Published 6+ papers at AAAI, DAC, DATE, ICCAD, IEEE TCAD/TECS

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(OnSpecta 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

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.

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 enabled Manycore Systems.** *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

- 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)

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 Interface: 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

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