HAFIZ MUHAMMAD OWAIS

ADAS/HAD System Lead

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SUMMARY

Highly proficient ADAS/AD development/validation system lead with 8+ years of experience, covering wide range of systems such as High Computing Platforms (HCPs), Intelligent perception (exterior/interior) and control systems as well as advanced driving and parking applications development. Well versed with Automotive standards, processes, systems/tools & agile methods. Developed and ADAS and perception systems which are currently being used in millions of VW Group vehicles.

EXPERIENCE

Project Lead: Intelligent Exterior & Interior Perception Systems

CARIAD SE (A Volkswagen Group Company)

Aug 2022 – on-going Ingolstadt, Germany

Software Project Lead Interior Cabin Monitoring System

- Definition of software development and integration requirements for interior driver & cabin monitoring systems
- Design and development of image pipeline and abstraction layers with the team of developers for multi-platform deployment
- Software architecture designing and modeling for in Cabin perception software component
- Interface definition, development and testing for different hardware accelerators i.e. for ISP, HWA/HTPs and different cores of SoCs for optimal resource allocation deployment
- Integration and Porting of in Cabin software component into designated middleware
- Supported on review and rating suppliers based on technical competence and compliance matrix for interior Cabin sensing software component
- Coordinating partner requirements by aligning with different stakeholders i.e. fusion layers, ADAS system HAL, backend, etc.
- Tracking, maintaining and ensuring implementation of defined requirements

Project Lead of Multi Function Camera System

- Lead the development of Intelligent Muti Function Camera system including HW, BSW and Perception
- Lead RegalFreigabe and coordinated, validated releases by closing various issues of Multi Function Perception System i.e. interfaces, DV/PV, EMC, Power Consumption, Heating/Cooling Function, Acoustics, etc.
- Monitoring and reviewing test plans, test cases and test reports for the validation of exterior intelligent perception system
- Analysing the cooling, heating and acoustics related issues. Devising the mechanism to bring into fail safe and robust recovery state
- Performing functional testing on prototype vehicle under different scenarios, capturing and analyzing logs, defining and updating datasets to improve the performance
- Prepared, ensured and delivered fulfillment of milestones & time plan especially for the BMG and DET
- Reporting progress and critical points to project escalation and steering rounds
- Ensured the tickets resolution on the problem management system by validating different critical issues

EDUCATION

Adaptive Strategic Execution Program (*hybrid*)

Duke University

Sep 2022 – Jul 2023

Self Driving Car Specialization (*online*)

University of Toronto

Jul 2020 – Sept. 2020

M.Sc. in Mechanical Engineering (*Computer Vision & Robotics*)

Beijing Institute of Technology

Sept 2016 – June 2018

B.Sc. in Electrical Engineering (*Electronics & Microelectronics*)

University of Engineering and Technology Taxila

Aug 2012 – Jun 2016

HONORS/AWARDS

- **Winner, Smart Mobility Hackathon**
  Honda
- **Winner, Innovative First/Last Mile Challenge**
  Skoda
- **Winner, Automated Valet Parking Challenge**
  Bosch
- **Winner, Angelhack Call For Code**
  Angelhack/IBM
- **Winner, International Robotics Challenge**
  MBZIRC
- **Awardee, Graduate Scholarship**
  CGS
- **Finalist, Coca Cola MENA Scholarship**
  USEFP

Project Lead/BTV: ADAP Computation Architecture

Mobility Asia (CARIAD CN): Audi/VW Group R&D Center

Jan 2021 – Jul 2022 | Beijing, China

- Project Management: Planned and tracked ECU development timelines, milestones, and software/hardware releases; set SMART KPIs for HW/SW development; reported project status in executive rounds.
- Requirement Engineering: Defined ADAS Domain Controller requirements for seamless E31.2 integration; aligned partner requirements with system architects, customer functions, and sensor BTVs.
- Hardware Development: Defined ECU mechanical/electronic interfaces (cooling, connections, pin mapping); led concept/design reviews; ensured compliance with VW standards; managed D-FMEAs and EMC testing.
- Software Development: Led AUTOSAR CP AP-based basic software development; tracked cross-functional requirement implementations (networking, diagnostics, security, power management); developed and validated Audi Standard Software modules (VKMS, SOK, VNSM).
- Testing & Integration: Supported component HiL setup; coordinated system, E/E, and vehicle-level testing; led supplier onsite test activities during pre-development.

ADAP System Development Engineer

VCIC:Audi/VW Group R&D Center

Jun 2020 – Dec 2020 | Beijing, China

- Preparation of requirements for Top View and Advanced Parking Functionality for L2++ ADAS System
- Preparation of requirements for ADAS Domain Controller for L2++ ADAS System
- Coordination & incorporation of partner requirements by aligning with various stakeholders i.e. System architect, customer functions, sensors BTVs, basic software function owners, etc.
- Tracked, maintained & documented project progress and all its relevant modules i.e. hardware software
- Defined new signals for the upcoming network integration packages within ADAS Domain Controller

Intelligent Perception Algorithm Engineer: Intelligent Driving Dept.

HiRain Technologies

Jul 2018 – May 2020 | Beijing, China

TopView App. & Fish Eye Calibration Toolbox

- Developed TopView application using 4 fish eye cameras
- Performed image denoising, deblurring, feature matching, stitching and blending
- Acquired intrinsic and extrinsic parameters of 4 fish eye cameras
- Created GUI to display the input and output parameters

Semantic Segmentation for Advanced Driving Functions

- Built DNN using Caffe for pixel-wise classification of multiple objects for advanced lane keeping and driving assist functions
- Trained models on GPUs, fine-tunned & quantized for embedded systems i.e. TDAxx
- Deployed and tested performance with efficiency of 60fps

Free Space & Localization for Automated Valet Parking

SW/PROGRAMMING

- **Programming:**
  Python | C/C++ | Pascal | MATLAB | LaTeX
- **Softwares/Tools:**
  Jira/Confluence/bitbucket/Jfrog | Bazel | Conan | Git Actions | DOORs | Codebeamer | Databricks | cPlace | Git | LABVIEW | SolidWorks | MS Office | Vector tools | VW Systems (SBT, Cptool, etc.)
- **Libraries/Frameworks:**
  ROS | OpenCV | Pytorch | Caffe | Docker | Codevision AVR

CERTIFICATIONS

- **High Performance Driver for Prototypes Vehicles on Ice as well as normal tracks**
  Porsche
- **Trained Driver for Prototypes Vehicles**
  Audi
- **Certified Architect Scaled Agile Framework**
  SAFE
- **Certified ArCHE System Designer**
  CARIAD
- **Advanced Project Mgmt.**
  VW
- **Ethical Hacking: Cryptography**
  LinkedIn
- **EIP: Electrically Instructed Person**
  VW
- **Product Compliance**
  VW
- **General Safety**
  VW

TRAININGS

- **Agile Softwware development**
- **iSTQB/iSAQB**
- **ADAS Systems**
- **PEP, SecPD, SecPEP**
- **ASPICE**
- **AUTOSAR Fundamentals**
- **Functional Safety**

- Developed DNN to detect free space in indoor outdoor parking environment
- Improved localization using visual SLAM alogorithm for indoor car parking

Distance Estimation for Multiple Traffic Lights

- Formulated and implemented distance estimation algorithm to estimate car distance from traffic lights using mono-cam
- Tested and compared results with GPS data as a ground truth

Multiple Object Sorting and Tracking

- Utilized data association and sorting algorithm for multiple object tracking
- Integrated object detection output with the sorting algorithm for object tracking

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Graduate Research Assistant

Beijing Advanced Innovation Center for Intelligent Robots Systems

Sept 2016 – Jun 2018 | Beijing, China

Online Extrinsic Parameter Calibration of 9 DOF Robotic Bionic Eyes (863 China's National Project)

- Worked on 9 degrees of freedom active stereo vision system for humanoid robot
- Established online continuous calibration algorithm using sparse correspondences
- Created simulation of 9DOF robotic eyes in ROS (GAZEBO and Rviz)

Vision-based Autonomous Landing System on moving vehicle (MBZIRC Project)

- A fast and robust ellipse detection method created using CNN.
- Improved edge combination algorithm to control the autonomous landing of UAV on a moving platform. it saved extra computational burden on system

Multi-modal Fusion for Autonomous Vehicle

- Worked on LiDAR, IMU, GPS, Stereo Camera and Wheel encoder for autonomous indoor navigation using turtlebot, processed data further fused through KF
- Obtained improved map using the depth data from the combination of LiDAR and the stereo camera system
- Incorporated AMCL(Adaptive Monte Carlo Localization) in order to improve the pose of robot

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Research Engineer

Virtual Reality and Driving Simulation Laboratory

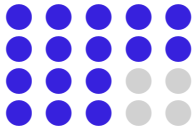
Oct 2015 – Jul 2016 | Taxila, Pakistan

Development of 6DOF Driving Simulator for SUV

- Designed and Developed Virtual Reality Environment and Driving Simulator using 4 projections
- Performed image rendering, scenario generation, projection blending
- Integration with 6DOF high fidelity driving simulator to reduce simulation adaptive syndrome

LANGUAGES

English
Urdu
Chinese
German



PUBLICATIONS

Journal Publication

1. Ren Jin, **Hafiz Muhammad Owais**, Defu Lin, Tao Song and Yifang Yuan "Ellipse Proposal and CNN Discriminant for Autonomous Landing Marker Detection" 2017. Submitted to *Journal of Field Robotics*

Conference Publications

1. Ren Jin, **Hafiz Muhammad Owais**, Defu Lin, Tao Song and Yifang Yuan "Towards Fast and Accurate Ellipse ans Semi Ellipse Detection" 2018. Submitted to *International Conference on Image Processing*
2. Taoran Zhang, **Hafiz Muhammad Owais**, Guilin Liu, Shaowen Fu, Ye Tian and Xiaopeng Chen. "Multi-loop stabilization control of a Robotic Bionic Eye" Submitted to *IEEE International Conference on Cyborg and Bionic Systems, 2017*
3. Guilin Liu, **Hafiz Muhammad Owais**, Taoran Zhang, Shaowen Fu, Ye Tian and Xiaopeng Chen. "Reliable eyes pose measurement for robotic bionic eyes with MEMS gyroscope and AKF filter" Submitted to *IEEE International Conference on Cyborg and Bionic Systems, 2017*
4. Di Fan, Xiaopeng Chen, **Hafiz Muhammad Owais**, Hyunwoo Kim, Ye Tian and Qiang Huang. "Design of an Anthropomorphic Robot Bionic Eyes" Submitted to *International Conference on Robotics and Biomimetics (ROBIO), 2017*