CHUONG HOANG NGUYEN

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OBJECTIVE

Seeking a researcher position in the field of Artificial Intelligent & Machine Learning, Autonomous Control, Robotics and Mechatronics

EDUCATION

Ph.D. Mechanical Engineering – Virginia Tech, Blacksburg, VA, 2012 - 2016.

- **GPA 3.86/4** – Major in Adaptive Control Theory, Robotics and Biomedical applications.
- Advisor: Dr. Alexander Leonessa.

M.S. Mechanical Engineering – Virginia Tech, Blacksburg, VA, 2010 **-** 2012.

- **GPA 3.97/4** - Major in Computer Vision and Mechatronics Applications.
- Advisor: Dr. Alfred L. Wicks.

B.S. Mechanical Engineering: Manufacturing Engineering, 2003 - 2008.

- Honor Program, Ho Chi Minh City University of Technology (**HCMUT**), Viet Nam.
- **GPA**: **8.48/10** – **Class Rank:** 5/255.

SOFTWARE SKILLS

Programming languages		**Design**	**Robotics**
Keras, Tensorflow,	LabVIEW	Inventor	ROS/ OpenCV / Linux
Pytorch	Qt	SolidWorks	Embedded System/Arduino
C/C++	Visual Studio	Autocad	Pixhawk/ Ardupilot
MATLAB/ Simulink	Flask/MySQL	3D-Printer	Unmanned Arial Vehicle

IMPORTANT COURSES

Advanced Linear Control I, II	Digital Signal Processing	Mechatronics I, II
Nonlinear Systems Control	Digital Image Processing	Robotics Dynamics
Adaptive Control System	Computer Vision	Bayesian Robotics
Geometric Control Theory	Machine Learning	Intro. to Stochastic
Unified System Dynamics	Reinforcement Learning	Calculus of Variation
	Deep Learning	

RESEARCH EXPERIENCE

Post-Doctoral Researcher, Human- Oriented Robotics and Control Lab, Arizona State University, **USA**, Jun 2016 – Jan 2018.

- Developed Machine Learning algorithms for Brain-Computer Interface systems, such as deciphering imagery speech or imagery voluntary motion, to control swarm of robots.
- Developed platform and control algorithms for swarm of mobile and aerial robots.
- Mentor for Undergrad and Grad students in research.

Graduate Research Assistant, Center for Dynamic Systems Modeling and Control, Virginia Tech, USA, Aug 2012 – May 2016.

- PhD Dissertation: Adaptive Predictor-Based Output Feedback Control of Unknown Multi-Input Multi-Output Systems: Theory and Application to Biomedical Inspired Problems
- Develop rehabilitation devices for patients suffering movement disorder by using Functional Electrical Stimulation (FES):
  - Developed adaptive control algorithms for systems that have uncertain nonlinear dynamics, multi-input multi-output, and high relative degree.
  - Implemented control algorithms to control musculoskeletal models using OpenSim, Matlab, and Simulink.
  - Experimentally validated the control algorithms on Quanser Helicopter Test Base through Matlab/ Simulink.
  - Implemented the control algorithms to control Fetch robotics arm through combination of ROS, C++, Python, and Simulink.
- Validated control and estimating algorithms on a scaled Ackermann steering based robotic car platform
  - Implemented sensor fusions and estimation algorithms, such as Extended Kalman Filter (EKF) and Particle Filters, for state estimation.
  - Implemented control laws, such as Sliding Mode Control, PID, to control vehicle position based on reference input.
  - All works were implemented through MATLAB and LabVIEW.

Research and teaching assistant, Mechatronics Lab, Virginia Tech, USA, Aug 2010 – May 2012.

- Master Thesis: Visual Perception System for Autonomous Ground Vehicles: Object Recognition and Tracking.
- Developed a vision software for a robotics car platform to perform multiple tasks, such as scene recognition, motion detection, and objects (i.e. human, vehicles) detection and tracking.
- All works were implemented through combination of OpenCV, MATLAB Vision Toolbox, and Machine Learning algorithms. The software is developed in C++ and Qt.
- Graduate Teaching Assistant in Mechatronics Class and Advanced Linear Control Class.

Work Experience

Machine learning Engineer at JIO Health - 83 Hoang Sa, 1st District, Ho Chi Minh, Vietnam. April 2018 - Now

- Develop a deep learning system to diagnose Xray images.
  - Improve the prediction accuracy (AUROC) up to 90% for 18 classes using a dataset of 360k images.
  - Testing different state of the art Deep Learning structures, such as DenseNet, ResNext, Dual Path Net, Squeeze and Excitation (SE), Convolution Block Attention Module (CBAM), and optimizers, such as Stochastic Weight Average Gradient (SWAG), Layer-Wise Adaptive Rate Scaling (LARS).
- Building an AI system to help Doctors diagnose patients' health:
  - Building database and micro-web services to collect data from patients.
  - From patient's sign/symptom, the AI system suggests the potential risks and the lab tests need to perform.

Intelligent UAS - 7040 Virginia Manor Road, Beltsville, MD 20705. Nov 2015 – Mar 2016

- Design an embedded system to control thermal cameras, such as FLIR TAU cameras. This work includes designing an integrated PCB with Arduino board, and writing controller software.
- Design 3D parts for commercial UAVs.

Intelligent Ground Vehicle Competition (IGVC), Virginia Tech Leonardo Team, Michigan, 2014.

- Chief member to develop a computer vision system for the robot navigation, such as detecting and following line on grass, and avoiding obstacles.
- The software was implemented through C++, OpenCV and LabVIEW.

DANAMECO Medical Joint-Stock Corporation, Da Nang, Viet Nam, 2009.

- Technical consultant for the company to purchase compress folding machine and ultrasonic welding machine.

Robotic Team of Mechanical Engineering Department, HCMUT, Robot Contest 2007, 2008 and 2010

- Mentor for the team in 2010. One of 24 selected teams competing in Nation Round in 2010.
- Team Leader in 2 years 2007, 2008.
- Designed and built the robots to perform various tasks, such as grasping blocks, passing bridge, and climbing stairs.
- Achieved the best idea and the best robot design in ROBOCON design competition hold by HCMUT in 2008.

Trainee at C1 factory of Mechanical Engineering Department, HCMUT, Summer - Fall 2007

- Bachelor Thesis: Design and simulate 3D Tube-bending machine.
- Experienced in operating lathes, millers, welding machines.
- Assembled hydraulic systems for Press and Break Iron Sheet Machines.

ACTIVIES

- Personal project - Summer 2013: Design and fully constructed the mechanical, electrical and software systems for quadrotors as a hobby.
- Personal project - July 2015: Build and control a human size humanoid robot (InMoov Robot) using 3D printer and Arduino board as a hobby.

HONORS & AWARDS

- Second Best poster in SouthWest Robotics Symposium, ASU, 2018.
- Best robotics paper award in ASME Dynamic Systems And Control Conference, Minnesota, 2016
- Hord Fellowship, Mechanical Engineering Department, Virginia Tech, 2014.
- U.S Government Scholarship: Vietnam Education Foundation (VEF) Fellowship since 2012.
- Award from HCMUT President for being selected team participating in the Vietnam National Competition Robot Contest (Robocon) 2010.

- Certificate of merit from HCMUT Dean of Mechanical Engineering Department for excellent academic results in 2003-2004 and 2006-2007.
- Two TOYOTA scholarships in 2006 and 2007.
- Award from HCMUT President for first ranking in first round of Vietnam South area Robocon 2007.
- Prize of the Annual National Mechanics Olympic Contest Year of 2005, Subject: Theory of machines and mechanism.
- Certificate of merit from HCMUT President for winning prize in Mechanics Olympic Contest 2005.

PUBLICATION

- Chuong H Nguyen and Panagiotis Artemiadis, "**Adaptive Multi-Degree of Freedom BCI using Online Learning: Towards Novel Methods and Metrics of Mutual Adaptation between Humans and Machines for BCI**, *accepted to PLOS One Journal, 2018*
- Chuong H Nguyen and Panagiotis Artemiadis, "**EEG Feature Descriptors and Discriminant Analysis under Riemannian Manifold perspective**," Neurocomputing, 275, pp. 1871-1883, 2018.
- Chuong H Nguyen, George K Karavas and Panagiotis Artemiadis, "**Inferring imagined speech using EEG signals: a new approach using Riemannian manifold features**," Journal of Neural Engineering, 15.1, 016002, 2018.
- C. Nguyen, A. Leonessa, **Adaptive Predictor-Based Output Feedback Control for a Class of Unknown MIMO Linear Systems**, *Journal of Nonlinear Science, 2016.*
- Chuong H Nguyen A. Leonessa, **Predictor-based Adaptive Output Feedback Control: Application to Functional Electrical Stimulation of a Human Arm Model,** *ASME Journal of Dynamic Systems, Measurement and Control, 2016*
- C. Nguyen, A. Leonessa, **Adaptive Predictor-Based Output Feedback Control For A Class Of Unknown MIMO Nonlinear Systems: Experimental Results,** *Proceedings of the 2015 American Control Conference, July 1-3 2015, Chicago, IL, USA.*
- C. Nguyen, A. Leonessa, **Control Motion of A Human Arm: A simulation study**, *International Conference of Control, Dynamic Systems, and Robotics Ottawa, Ontario, Canada, May 15-16 2014.*
- C. Nguyen, A. Leonessa, **Adaptive Predictor-Based Output Feedback Control for A Class Of Unknown MIMO Linear Systems,** *Proceedings of the ASME 2014 Dynamic Systems and Control Conference DSCC 2014 October 22-24, 2014, San Antonio, TX, USA.*
- C. Nguyen, A. Leonessa, **Adaptive Predictor-Based Output Feedback Control for A Class Of Unknown MIMO Linear Systems: Experimental Results,** *Proceedings of the ASME 2014 Dynamic Systems and Control Conference DSCC 2014 October 22-24, 2014, San Antonio, TX, USA*

PROF. ORG **IEEE, ASME**