

KHOA NGUYEN

Calgary, Alberta.
306-280-2583 | nhdkhoal994@gmail.com

SKILL HIGHLIGHTS

- **Led the project** of building a portable device for noninvasively monitoring blood glucose.
- **Experience and proficiency in machine learning, signal and image processing, computer vision and biophotonics.** Utilized infrared (IR) light with machine learning to predict glucose concentration; utilized IR or polarized light to extract vein patterns or extract biomaterial characteristics.
- In charge of designing and setting up experiments of the **biophotonics lab** at International University HCMC. Experienced with laboratory safety. Experienced in using **programming languages** (Python 3, MATLAB, Javascript) and **statistical software** (Microsoft Excel, SPSS).
- Strong **communication skills**. Written communication: thesis and scholarship applications, prepared abstracts and manuscripts. Collaboration with **multiple research groups** led to publications. Oral communication: **mentored** new undergraduate students within the school, **volunteer tutoring** for university students, and **posters** and **seminar presentations**.

EDUCATIONS AND QUALIFICATIONS

Master of Science, Division of Biomedical Engineering, University of Saskatchewan (2021)

Bachelor of Engineering, School of Biomedical Engineering, Vietnam National University – International University HCMC (2016)

EXPERIENCE

Graduate Researcher

2018-2021

- Investigated and implemented hardware using short-wave infrared wavelength (SWIR) to acquire the absorbance of various sample solutions.
- Collected and analyzed over 170,000 data points of β -D-Glucose solution data and established guidelines for data acquisition.
- Built automated pipelines to extract most informative wavelengths for blood glucose monitoring using Feature Selection and Feature Extraction.
- Investigated and optimized the effectiveness of Support Vector Machines (SVMs) to predict glucose concentrations by combining with other machine learning techniques such as hyperparameter tuning and nested cross-validation.
- Troubleshooted several obstacles in developing automated machine learning model for predicting blood glucose concentration. Self-motivated to finish the project.
- Experienced in machine learning languages, techniques and libraries, tools, platform: Python 3, MATLAB, Scikit-learn, MLxtend, Numpy, Scipy, Pandas, Tensorflow, Keras.

Undergraduate Researcher

2014-2016

- Constructed an embedded system for vein patterns imaging using a Raspberry Pi 2, Simulink graphical programming environment, and infrared (830nm) technology. Performed signal and image processing with OpenCV library to visualize the veins then utilized MATLAB computer vision toolbox to extract the vein patterns.
- Designed and set up of photonic systems in BMEIU Biophotonics Lab. Arranged specific optics and optomechanics components and devices for each experiment; designed optical post assemblies, mounts using SolidWorks for manufacturing.
- Wrote LabVIEW scripts to calibrate and control the Thorlabs, Inc. PAX5710 polarimeter; wrote MATLAB functions and scripts to read the polarimeter's intensity output and calculate Stokes parameters, extract biomaterial characteristics.
- Experienced in electrical techniques, programming languages and biophotonics lab equipment: I2C, UART, SPI, embedded system, digital signal and image processing, computer vision, MATLAB, Simulink, LabVIEW, Python, SolidWorks, biophotonics.

Volunteer at the BME6 International Conference**2016**

- Led a technical support team to ensure smooth operation of the BME6 International Conference. Examined the documentation and schedule with speakers prior to the conference. Checked lighting, sound and audio equipment, video and projection system.
- Directed guests to the correct rooms, facilities at the International University campus. Responded to emergency situations, requests.

Research Intern at University of Saskatchewan**2015**

- Designed heterogeneous breast phantom and experiments to collect physiological data and inspect the effectiveness of ultra-wideband waves (3.1-10.6GHz) to detect breast cancer.

PUBLICATIONS

K. Nguyen, A. Dinh, F. Bui. (2020). Determination of SWIR Features for Noninvasive Glucose Monitoring Using Machine Learning. 2020 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE), London, ON, Canada, pp. 1-4, doi: 10.1109/CCECE47787.2020.9255775.

Nguyen K.HD., Nguyen A.LT., Pham H.TT. (2018). Constructing Real Time Vein Imaging Device Utilizing Near Infrared Technology and Embedded System. In: Vo Van T., Nguyen Le T., Nguyen Duc T. (eds) 6th International Conference on the Development of Biomedical Engineering in Vietnam (BME6). BME 2017. IFMBE Proceedings, vol 63. Springer, Singapore, doi: 10.1007/978-981-10-4361-1_95

Nguyen A.LT., **Nguyen K.HD.**, Pham H.TT. (2018). A Novel Method for Extracting Characteristics of Bio-materials Utilizing Optical Polarizing System. In: Vo Van T., Nguyen Le T., Nguyen Duc T. (eds) 6th International Conference on the Development of Biomedical Engineering in Vietnam (BME6). BME 2017. IFMBE Proceedings, vol 63. Springer, Singapore, doi: 10.1007/978-981-10-4361-1_94

Nguyen Huu Dang Khoa, Pham Thi Thu Hien, Le Thanh Hai (2016). A Real-Time Embedded Vein Detection System Utilizing Near Infrared Technology. In Proceedings of the 8th Vietnam Conference on Mechatronics (VCM2016). ISBN 978-604-913-503-3

AWARDS

- | | |
|--|-------------------------|
| • Mitacs Globalink Graduate Fellowship (\$15,000) | 2018 |
| • Best Student Poster Presentation of the 6 th International Conference on the Development of Biomedical Engineering in Vietnam (\$100) | 2016 |
| • Vietnam National University's Award for Potential Student Research Project (\$300) | 2015 |
| • Mitacs Globalink Research Internship (\$7,500) | 2015 |
| • Vietnam National University's Scholarship for Outstanding Academic Performance (\$1,500) | 2012, 2013, 2014 |