DUC MANH NGUYEN PH.D.

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SUMMARY

- Solid experiences on research and development the digital signal, image, audio processing algorithms.
- Solid programming skill, simulation experience in high level languages MATLAB/Octave, C/C++, Python.
- Solid RTL coding experience in Verilog HDL, solid digital system design experience in ASIC/ FPGA.
- Understanding about IC test and verification process such as synthesis, STA, Power-simulation, DFT.
- Strong background in mathematical such as: Coding theory, Abstract algebra, Linear system, transformation.
- My current interests include: Digital ASIC, Digital front-end, MATLAB HDL coder, Active pen protocol, Touchscreen system, ML/DL/AI system design.

EDUCATION

UNIVERSITY OF ULSAN-UOU *02/2015-02/2020 / Korea*

PH.D. IN ELECTRICAL ENGINEERING

- Researcher assistant at Coding and Information theory lab.

HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY-HUST *09/2007-06/2012 / Vietnam*

B.S IN ELECTRONICS AND TELECOMMUNICATION

- Image processing, GSM system.

EXPERIENCE

G2TOUCH *03/2020-now / Korea*

RESEARCHER AND ENGINEER

- Digital system design of active pen supported touchscreen controller IC.

ADVANCED NETWORK SYSTEM VIETNAM *6/2014-2/2015 / Vietnam*

NETWORK SYSTEM ENGINEER

- maintain and deploy Charging services for VMS-Mobifone.

SAMSUNG ELECTRONIC VIETNAM *9/2012-5/2014 / Vietnam*

MOBILE SOFTWARE DEVELOPER

- Customer adaptive modification of android smart-phone models.

PANASONIC RND CENTER *1/2012-3/2012 / Vietnam*

INTERNSHIP STUDENT

- 3D-Graphic Software developer.

SKILLS

PROGRAMMING	***Experienced:*** Verilog HDL | MATLAB ***Familiar:*** C | Cpp | Shell | Python | Java
IC DEVELOPMENT	ASIC RTL coding/ verification | VLSI front end | SoC | IP cores | Digital system design | DSP
EMBEDDED	Altera D10-standard | Andes D10 core | STM32F401 | ADS5271 | Arduino-UNO
FRAMEWORKS/LIBRARIES	Orge 3D | Open GL | Open CV | Android SDK | Anaconda | Jupyter | Matplotplib | Numpy
LANGUAGES	***Native:*** Vietnamese ***Fluent:*** English ***Intermediate:*** Korean

EXTRA

- My life is around transformation: Hadamard, Hilbert in university and digital filters, Fourier in company.
- I like bolero, folk songs, and crazy about football.
- I dream a lot and always work hard to make them come true.

Tasks in G2touch

SW Active pen signal simulation

- Active pen-Touch screen communication protocol specification.
- Scenarios simulation for active pen signal in MATLAB.
- Main clock based simulation for active pen signal in Verilog HDL.

FPGA/Embedded - Active pen supported touchscreen controller: Evaluation board

- EVB setup: FPGA Altera D10-standard, extra MCU(Andes D10 core), and STM32F401 board.
- Capacitance sensing sensor design, MUX controller with STM32F429ZI, NUCLEO-L552ZE.
- ADC ADS5271 with IP cores LVDS bus, SPI bus controller interface.
- SRAM memory, FIFO memory controller.
- evaluate the method to detect and synchronize active pen signal.
- evaluate the method to reconstruct and process raw signal of Active pen using DSP algorithms.
- evaluate the method to distinguish the Tip Pressure from 256 levels.
- evaluate the method to separate/ extract tip/tilt information for each symbol.
- SNR calculation of active pen signal, with display noise and no-display noise.

ASIC - Active pen supported touchscreen controller: Beacon detection module

- Matched filter design and specification for detection module.
- Measured, simulated, designed the reference beacon symbol.
- Down-sampling filter module for optimization resource of matched filter design.
- Convolution product module between Ref. Beacon and active pen raw signal.
- Peaks detector module to determine begin and end time of each active pen frame.

ASIC - Active pen supported touchscreen controller: FSK demodulation module

- Measured, simulated, designed the reference bit symbols.
- Digital filter: LPF, BPF, HPF based on FIR/IIR designs and simulation in MATLAB, implementation in Verilog HDL.
- Down-sampling filters designs and simulation in MATLAB, implementation in Verilog HDL.

ASIC/SW - Active pen supported touchscreen controller: Fast Fourier transform

- MATLAB-FFT based analyzer of active pen signal for simulation, testing, design.
- FFT algorithm analysis: Radix-2 butterfly algorithm, single-path delay-feedback processor.
- Implemented those FFT module in Gcc for many length Nfft.
- Implemented those FFT module in Verilog HDL for many length Nfft.

Patent submission (under review)

- Entitle: ”Means and method for decoding active pen signal”, ”means and method for synchronization between active pen and touchscreen”.
- The matched filter module is to detect the beacon symbol and synchronize between active pen and touch controller.
- Then, the de-modulator modules such as FSK or FFT are used for each type of symbols.

Results in University of Ulsan

Researches on quantum error correction codes

- **D.M. Nguyen**, S. Kim. *Minimal-Entanglement Entanglement-Assisted Quantum Error Correction Codes from Modified Circulant Matrices*. Symmetry. 9(7) pp(122) (7/2017). (SCIE, Q2, IF(1.457)) https://doi.org/10.3390/sym9070122
- **D.M. Nguyen**, S. Kim. *Quantum stabilizer codes construction from Hermitian self-orthogonal codes over GF(4)*. Journal of Communications and Networks. 20(3) pp(309-315) (6/2018). (SCIE, Q2, IF(1.252)) https://doi.org/10.1109/JCN.2018.000043
- **D.M. Nguyen**, S. Kim. *New Constructions of Quantum Stabilizer Codes Based on Difference Sets*. Symmetry. 10(11) pp(655) (11/2018). (SCIE, Q2, IF(1.256)) https://doi.org/10.3390/sym10110655
- **D.M. Nguyen**, S. Kim. *New construction of binary and non-binary quantum stabilizer codes based on symmetric matrices*. International Journal of Modern Physics B, 33(24), 1950274, 2019. (SCI, Q4, IF(0.863)) https://doi.org/10.1142/S0217979219502746
- **D.M. Nguyen**, S. Kim. *Quantum Stabilizer Codes Based on a New Construction of Self-orthogonal Trace-inner Product Codes over* $GF(4)$. International Journal of Modern Physics B, 34 (5), 2050017, 2019. (SCI, Q4, IF(0.863)) https://doi.org/10.1142/S0217979220500174

• **D.M. Nguyen**, S. Kim. *A novel construction for quantum stabilizer codes based on binary formalism*. International Journal of Modern Physics B, 34 (8), 2050059, 2020. (SCI, Q4, IF(0.863)) https://doi.org/10.1142/S0217979220500599

• **D.M. Nguyen**, S. Kim. *Construction and complement circuit of a quantum stabilizer code with length 7*. in Proceedings of Eighth International Conference on Ubiquitous and Future Networks (ICUFN), Wien, Austria. pp(332-336) (7/2016). https://doi.org/10.1109/ICUFN.2016.7537043

• **D.M. Nguyen**, S. Kim. *Construction of quantum stabilizer codes from self-orthogonal linear codes*. in Proceedings of Symposium of the Korean Institute of communications and Information Sciences. pp(248-249) (6/2018). http://www.dbpia.co.kr/Journal/ArticleDetail/NODE07512514

• **D.M. Nguyen**, S. Kim. *Application of additive codes over GF(4) on quantum error correction codes*. in chapter of: Frontiers in Intelligent Computing: Theory and Applications pp 116-122. (01/2020). https://doi.org/10.1007/978-981-32-9186-7_13

RESEARCHES ON QUANTUM ALGORITHMS

• **D.M. Nguyen**, S. Kim. *Quantum Key Distribution Protocol Based on Modified Generalization of Deutsch-Jozsa Algorithm in d-level Quantum System*. International Journal of Theoretical Physics, 58(1) Jan. 2019. (SCIE, Q3, IF(1.121)) https://doi.org/10.1007/s10773-018-3910-4

• **D.M. Nguyen**, S. Kim. *Multi-Bits Transfer Based on the Quantum Three-Stage Protocol with Quantum Error Correction Codes*. International Journal of Theoretical Physics, 58(6) Apr. 2019. (SCIE, Q3, IF(1.121)) https://doi.org/10.1007/s10773-019-04098-4

• **D.M. Nguyen**, S. Kim. *The fog on: Generalized teleportation by means of discrete-time quantum walks on N -lines and N -cycles*. Modern Physics Letters B. 33(23), 1950270, Aug. 2019. (SCI, Q4, IF(0.731)) https://doi.org/10.1142/S0217984919502701

• M.Zidan, A. Abdel-Aty, **D.M. Nguyen**, S. Hegazy, Y. Al-Sbou, H. Eleuch and M. Abdel-Aty, *A Quantum Algorithm based on Entanglement Measure for Classifying Boolean Multivariate Function into Novel Hidden Classes*. Results in Physics, 15, 102549, 2019. (SCIE, Q1, IF(3.02)) https://doi.org/10.1016/j.rinp.2019.102549

• **D.M. Nguyen**, S. Kim. *A Novel Quantum No-Key Protocol for Many Bits Transfer with Error Correction Codes*. Advances in Science, Technology and Engineering Systems 5 (2), 781-785, 2020. (Scopus) 10.25046/aj050298

• **D.M. Nguyen**, S. Kim. *A Study on a Quantum Three Pass Protocol for Multiple Bits Transfer*. in Proceedings of Symposium of the Korean Institute of communications and Information Sciences. (6/2019). http://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE09234961

• **D.M. Nguyen**, S. Kim. *A quantum three pass protocol with phase estimation for many bits transfer*. in Proceedings of International Conference on Advanced Technologies for Communications (ATC 2019, Ha-Noi, Viet-Nam). (10/2019). 10.1109/ATC.2019.8924514

IOT PROJECT

• Design the location estimation algorithm for Indoor position and navigation.

• Implemented in embedded system with Arduino Nano board and using external devices such as HM-10, and LCD I2C.

PROJECT IN ANSV

MAINTAIN AND EXTEND THE BILLING SYSTEM FOR VMS

• The call flow, SIGTRAN/ SS7 signaling system in a telecommunication system.

• Unix Shell script, awk/sed, Pearl programming for installing, debugging, upgrading the Oracle database, ICC platform, ICC services system.

• Installed and deployed Server, Sun Storage, Solaris, Unix operating system.

PROJECT IN SVMC

ANDROID MOBILE PROJECT

• maintained Android setting/CSC app for upgraded version of Android OS.

• developed, tested, handled of Android software project for Samsung mobile phone in South East Asia markets.

ASSIGNMENT IN PRDCV

PANASONIC ECOCKPIT AUTOMOTIVE SYSTEM

• simulated a Hachune 3D model by using object rendering engines of Orge 3D and Irrlicht engine.

• investigated their performance and selected a suitable 3D engine for e-Cockpit project.

ADDITIONAL WORKS

TEACHING ASSISTANT

• DSP class for undergraduate student, school of electrical engineering, University of Ulsan, 2018, 2019.

PAPER REVIEWERS, CONFERENCE COMMITTEE

• IEEE Communication letter. IEEE Access. International journal of Modern Physical B. Indian Journal of Physics. Modern Physical letter B. Symmetry. Photonics. SN Computer science.

• INFOCOMP 2019, 2020, 2021. ICTCC and ICCASA 2019, 2020, 2021.

BOOK CO-AUTHOR

• "Role of Technology in the Sustainable development of Smart Cities". Chapter of Flexible communications technologies. (plan: 2021)

• "Basic Digital Systems: MATLAB design and Verilog HDL implementation." (plan: 2022)

CO-RESEARCHER

• Binh A. Nguyen, Viet Q. Tran, Khoa D. Ta, Manh Hoang, Thien V. Truong, Nhan D. Nguyen, **D.M. Nguyen**, *Simulation of Quantum Computation via MAGMA Computational Algebra System*. Int. J. of Advanced Trends in Computer Science and Engineering, 9 (2), 1757-1761, 2020. (Scopus) https://doi.org/10.30534/ijatcse/2020/130922020

• Binh A. Nguyen, Viet Q. Tran, Khoa D. Ta, Manh Hoang, Thien V. Truong, Nhan D. Nguyen, **D.M. Nguyen**, *A Novel Framework for Simulation of Quantum Information System*. Int. J. of Advanced Trends in Computer Science and Engineering, 9 (2), 1752-1756, 2020. (Scopus) https://doi.org/10.30534/ijatcse/2020/129922020

• GN Pham, BA Nguyen, VQ Tran, KD Ta, PH Nguyen, **D.M. Nguyen**, *Simulation of Resources for Quantum Algorithms and Quantum Communication Protocols based on a Novel Framework*. Int. J. of Advanced Trends in Computer Science and Engineering, 9 (3), 3125-3129, 2020. (Scopus) https://doi.org/10.30534/ijatcse/2020/97932020

• Hieu V. Dang, Tung V. Nguyen, Manh Hoang, Viet Q. Tran, Nhan D. Nguyen and **D.M. Nguyen**, *Design and verification of novel classical error control codes using VERILOG Hardware Description Language*. Int. J. of Advanced Trends in Computer Science and Engineering, 9 (4), 2020. (Scopus) https://doi.org/10.30534/ijatcse/2020/232942020

• Phuong H. Lai, Manh Hoang, Viet Q. Tran, Tung V. Nguyen, Thien V. Truong, Phong H. Nguyen and **D.M. Nguyen**, *Analysis and implementation of SDF Radix-2 FFT processor using VERILOG Hardware Description Language*. Int. J. of Advanced Trends in Computer Science and Engineering, 9 (4), 2020. (Scopus) https://doi.org/10.30534/ijatcse/2020/144942020

• Phuong H. Lai, Manh Hoang, Viet Q. Tran, Tung V. Nguyen, Thien V. Truong, Phong H. Nguyen and **D.M. Nguyen**, *Pipelined Digital Filters and Their Applications: FDATOOL Design and VERILOG HDL Verification*. International Journal of Emerging Trends in Engineering Research, 8 (9), 2020. (Scopus) https://doi.org/10.30534/ijeter/2020/44892020

• Phuong H. Lai, Manh Hoang, Viet Q. Tran, Tung V. Nguyen, Thien V. Truong, Phong H. Nguyen and **D.M. Nguyen**, *Mixed-signal generator module:Design and Verification in MATLAB and Verilog hardware description language*. International Journal of Emerging Trends in Engineering Research, 8 (9), 2020. (Scopus) https://doi.org/10.30534/ijeter/2020/28892020

• Phuong H. Lai, Manh Hoang, Viet Q. Tran, Tung V. Nguyen, Thien V. Truong, Phong H. Nguyen and **D.M. Nguyen**, *Signal generator module based on CORDIC algorithm: Design, implementation, and verification using MATLAB and Verilog HDL*. Int. J. of Advanced Trends in Computer Science and Engineering, 9 (5), 2020. (Scopus) https://doi.org/10.30534/ijatcse/2020/258952020