# CURRICULUM VITAE

Elise H. J. DE DONCKER Department of Computer Science

Professor, Computer Science Western Michigan University

Kalamazoo, MI 49008

Doctorate (Mathematics):

“Numerical Integration and Asymptotic Expansions”

Katholieke Universiteit Leuven, Belgium (1980)

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[http://www.cs.wmich.edu/elise](http://www.cs.wmich.edu/~elise)

**Professional Experience**

1982 – present Western Michigan University

1989 – 1990 Sabbatical leave, CalTech

1981 – 1982 Visiting Professor, Delft University of Technology, the Netherlands

1974 – 1981 Scientific Assistant, Katholieke Universiteit Leuven, Belgium

**Awards**

CEAS Outstanding Researcher Award 2006, Western Michigan University

Distinguished Faculty Scholar Award 2003, Western Michigan University

IBM Prize for Informatics,Belgium 1981

**Research Interests**

Parallel algorithms and large-scale computation; scientific algorithms and computations; design and analysis of algorithms; numerical analysis, particularly numerical integration; computational mathematics, physics, finance; quantum physics/computing; medical/bio-informatics; genetic/evolutionary algorithms; neural networks; deep learning; theory of computation

**Grants**

* WMU 2021 – 2022 Faculty Research and Creative Activities Award (FRACAA): Artificial Intelligence for Smarter Additive Manufacturing, with P. Ari-Gur (PI), June 15 2021 – June 14 2023 ($10,000)
* NSF CMMI – SERVICE ENTERPRISE SYSTEMS: SAMPLING CRITERIA FOR MONITORING INFLUENZA EMERGENCIES UNDER CONSTRAINED TESTING CAPABILITIES, E. de Doncker (PI WMU), D. Prieto (Subcontract Johns Hopkins Univ.), R. Paul (Subcontract UNC Charlotte), Sept. 1 2015 – Aug. 31 2020 ($199,646)
* NSF REU Supplement to NSF CMMI: SAMPLING CRITERIA FOR MONITORING INFLUENZA EMERGENCIES UNDER CONSTRAINED TESTING CAPABILITIES, E. de Doncker (PI WMU), D. Prieto (Subcontract Johns Hopkins Univ.), R. Paul (Subcontract UNC Charlotte), July 12, 2016 – Aug. 31 2020 ($5,000)
* IRB with MDHHS IRB Log # 201511-06-XA is ongoing for the study SAMPLING CRITERIA FOR MONITORING INFLUENZA EMERGENCIES UNDER CONSTRAINED TESTING CAPABILITIES
* NVIDIA CUDA Teaching Center (CTC), E. de Doncker and J. Kapenga (May 2012)
* NSF MRI: ACQUISITION OF A HIGH PERFORMANCE CLUSTER FOR MULTIDISCIPLINARY COMPUTATIONAL RESEARCH, E. de Doncker (PI), P. Gustafson, K. Kaugars, W. Liou, Y. Mo, Selected by WMU (Nov. 2010), NSF Award 1126438 (Sept. 2011), Oct. 2011-2016 (total $413,676)
* BOEING grant, with K. Kaugars, 2006 ($19,000)
* WMU Internet 2 Funding: Nano@I2, with Paul D. Fleming, K. Kaugars, John B. Miller and Dewey Qi, 2003 ($30,000)
* NSF Award ACI-0203776: DISTRIBUTED MULTIVARIATE INTEGRATION IN A PROBLEM SOLVING ENVIRONMENT, E. de Doncker (PI), K. Kaugars, A. Gupta and A. Genz, 2002-2005 ($348,495)
* WMU Internet 2 Funding: Globally Accessible Integration Services over Internet 2, E. de Doncker and K. Kaugars, 2002 ($30,000)
* NSF Award EIA-0130857: INFORMATION VISUALIZATION AND INCREMENTAL KNOWLEDGE DISCOVERY IN A CLUSTER COMPUTING ENVIRONMENT, E. de Doncker, K. Kaugars, L. Yang and M. Mohania, 2001-2003 ($292,870)
* WMU Summer grant preparation support, E. de Doncker and K. Kaugars, 2001 ($7,000)
* WMU CEAS JUMPSTART FUNDING: ENHANCING THE WMU-CS CLUSTER, E. de Doncker, K. Kaugars and A. Gupta, 2001 ($50,000)
* NSF Award ACR-0000442: DISTRIBUTED NUMERICAL INTEGRATION ALGORITHMS AND APPLICATIONS, E. de Doncker (PI), A. Gupta and A. Genz, 2000-2002 ($316,343)
* NSF Award CDA-9022562: PARALLEL AND DISTRIBUTED INTEGRATION ALGORITHMS, E. de Doncker (PI), A. Gupta and A. Genz (subcontract), 1994 ($146,631 of which $21,475 cost share)
* NSF: CISE Research Instrumentation grant, E. de Doncker (PI), J. Kapenga, D. Ferraro and J. D. Nelson, ($380,350 of which $190,175 cost share)
* nCUBE: University grant for algorithm and software development (with J. Kapenga) ($493,585)
* UPJOHN: SET OF UNIX NEURAL NETWORK UTILITIES (with J. Kapenga and R. Trenary) ($16,000)
* PROFESSIONAL MEDICAL MANAGEMENT, Inc.: BASIC TO C TRANSLATOR (with J. Kapenga and B. Pinkowski) ($12,000)
* STW (”Foundation for Technical Sciences"), the Netherlands: Research, Delft University of Technology, the Netherlands (with J. Kapenga), 1985-1986
* University of New South Wales, School of Mathematics, Kensington, Australia: an Honorary Fellowship, 1984
* SLATEC, through the Lawrence Livermore National Laboratory: funding for port of Quadpack to SLATEC library, 1981 ($15,000)
* IBM: the IBM Prize for Informatics, 1981 (Belgium)
* Stanford University: Summer grant, 1981
* Argonne National Laboratory: Research participation, 1979

**Professional Activities and Professional Development**

**Synergistic Activities**

**Director, Center for High Performance Computing and Big Data (HPCBD**) (with J. Kapenga)

**Director, High Performance Computational Science (HPCS) Laboratory**(with J. Kapenga)

**Director, NVIDIA CUDA Teaching Center/GPU Education Center WMU** (April 2012 – July 2017/end date of all NVIDIA Centers, with J. Kapenga)

**Collaborator** “Large Scale Computational Science on Heterogeneous Many-Core Computer” project for MEXT (Ministry of Education, Culture, Sports, Science and Technology in Japan), and computations on PEZY Exascaler supercomputer

**Professional Partnership, equipment donation from NVIDIA** (January 2012)

**Guest Editor, Journal of Computational Science**, JoCS Special Issue, **Scientific Computations, Methods and Applications**(2010-2012)

**Conference/workshop organization**

* Workshop Chair (with F. Yuasa and H Matsufuru): Computational Science and HPC (CSHPC) 2021, 2022, at the International Conference on Computational Science and its Applications (ICCSA 2021, 2022); Large Scale Computational Science (LSCS), at ICCSA, Cagliari, Italy (Online 2020), Melbourne, Australia (2018); (with F Yuasa) Large Scale Computational Physics (LSCP), at the International Conference on Computational Science (ICCS): Zurich, Switzerland (2017); San Diego, CA (2016); Reykjavic, Iceland (2015); Cairns, Australia (2014); Barcelona, Spain (2013); Vancouver, Canada (2012); Singapore (2011)
* Session Chair, at 18th International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT), Seattle, OR (2017)
* Session Chair, at Computational Particle Physics (CPP), High Energy Accelerator Research Organization (KEK), Tsukuba, Japan (2016)
* Session Chair at Computational Particle Physics (CPP), Computational Particle Physics), High Energy Accelerator Research Organization (KEK), Tsukuba, Japan (2010)
* Workshop Chair: Numerical Methods and Modeling/Simulations in Computational Science and Engineering (NNMS),atthe International Conference on Computational Science and Applications (ICCSA), Kyushu Sangyo University, Fukuoka, Japan (2010)
* Workshop Chair: Numerical Integration and Applications (NIA),at Glasgow, Scotland (2006)
* Conference: Computing in the 90s – First Great Lakes Computer Science Conference (Proceedings editor)

**Software distributions**

**Quadpack,** R. Piessens, E. de Doncker, C. W. Überhuber, D. K. Kahaner, QUADPACK – A Subroutine Package for Automatic Integration, Springer Series in Comp. Math. **1,** 1983. **ParInt,** E. de Doncker, A. Gupta, A. Genz., R. Zanny (Copyright ParInt 1.0, 1999)

**Scientific, professional, honor societies and memberships.** Association for Computing Machinery (ACM),

Numerical Algorithms Library (NAG), Upsilon Pi Epsilon (UPE), Amnesty International, American Association of Pilots and Aircraft Owners (AOPA)/Air Safety Foundation (ASF), ASPCA

**Designated Committees**

Academic Program Review and Planning (APR&P) Observation Committee (2014-2015)

WMU CEAS Medical Engineering group (First year)

WMU Presidential Commission on Gender Equity (2010-2011)

**Reviewer for journal and conference publications**

Incl. ACM Transactions on Mathematical Software (TOMS); Software Quality Journal (SQJO); Progress in Particle and Nuclear Physics; J. Mathematics of Computation; Int. Conf. Comp. Sc. (ICCS); Int. Conf. Comp. Sc. & Applics. (ICCSA)

**Mentor** (KAMSCI), incl. two mentees who received awards for their projects (incl. Ben Mehne, with a project on “An Equation Based Method for storing Image Data”, March 2010)

**Developer:NAG** (Numerical Algorithms Library)

**Consulting/Maintaining:** Quadpack, ParInt software (ongoing)

**Books, Book Chapters**

* Monte Carlo Automatic Integration with Dynamic Parallelism in CUDA”, E. de Doncker, J. Kapenga and R. Assaf, Book chapter in “Numerical Computations with GPUs”, Ed. V. Kindratenko, Pub. Springer (2014), ISBN 978-3-319-06547-2 (Print), 978-3-319-06548-9 (Online), pp. 273-298
* Scientific Computation Methods and Applications, Ed. (with K. Kaugars), Journal of Computational Science (JoCS), Volume 3 (2012) <https://www.sciencedirect.com/science/article/abs/pii/S1877750312000294>
* Toward Automatic Regularization for Feynman Loop Integrals in Perturbative Quantum Field Theory. In Measurements in Quantum Mechanics, Ed. M. R. Pahlavani, 2012, ISBN 978-953-51-0058-4.
* Computing in the 90s*,* Eds. N. A. Sherwani, E. de Doncker and J. A. Kapenga, Springer Lecture Notes in Computer Science **507**, 1991, ISBN 3-540-97628-0, 0-387-97628-0
* QUADPACK *–* A Subroutine Package for Automatic Integration*,* Springer Series in Comp. Math. **1,** 1983.

**2011-2021 Selected Presentations**

* Numerical Calculation of Feynman Integrals: Electroweak Higher-Order Correction by DCM III, F Yuasa (presenter), E de Doncker, K Kato, H Daisaka and N Nakasato, The 77th Annual Meeting of the Physical Society of Japan (JPS), March 2022
* Self-Energy Feynman Diagrams with Four Loops and 11 Internal lines, E de Doncker (presenter) and

F Yuasa, 21st International Conference in Computational Science and its Applications (ICCSA 2021), <https://link.springer.com/chapter/10.1007%2F978-3-030-86976-2_11>

* Numerical Regularization for 4-loop Self-Energy Feynman Diagrams, E de Doncker (presenter), F Yuasa and

T Ishikawa, 20th International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT 2021), Nov. 29 – Dec. 3, 2021, <https://indico.cern.ch/event/855454>

* Unsupervised Learning Model to Uncover Hidden Knowledge from COVID-19 Vaccines Literature,

T Gharaibeh (presenter) and E de Doncker, 21st International Conference in Computational Science and its Applications – ICCSA 2021, Workshop on Advancements in Applied Machine Learning and Data Analytics – AAMDA 2021, Sept. 2021

* Unsupervised Learning with Word Embeddings Captures Quiescent Knowledge from COVID-19 Literature,

T Gharaibeh and E de Doncker, Symposium on Artificial Intelligence (CSCI-ISAI 2020) (Dec. 2020), <https://ieeexplore.ieee.org/document/9457998> (presented by T Gharaibeh)

* Computation of Multi-Scale Multi-Loop Feynman Integrals using DCM (II), F Yuasa (presenter), K Kato, T Ishikawa, H Daisaka, N Nakasato, E de Doncker, JPS Meeting 2020 Autumn, Japan
* Large Scale Automatic Computations with up to Five Loops, E de Doncker, F Yuasa, O Olagbemi and

T Ishikawa, 20th International Conference in Computational Science and its Applications (ICCSA 2020, held online), <https://link.springer.com/chapter/10.1007%2F978-3-0-58814-4_11>

doi: [10.1007/978-3-030-58814-4\_11](https://dx.doi.org/10.1007%2F978-3-030-58814-4_11)

* Numerical Multi-Loop Integration on Heterogeneous Many-Core Processors, E de Doncker, F Yuasa,

A Almulihi, N Nakasato, H Daisaka and T Ishikawa, 19th International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT 2019), Saas-Fee, Switzerland (March 2019), <https://indico.cern.ch/event/708041/overview>

* Many-Core Multivariate Integration on GPU and PEZY. E de Doncker (presenter), A Almulihi and F Yuasa, Half-day Workshop on Multi-loop Feynman Integrals, High Energy Accelerator Research Organization (KEK), Tsukuba, Japan (July 2018)
* Automatic High-speed Evaluation of Loop Integrals using Lattice Rules. E de Doncker (presenter), A Almulihi, F Yuasa, 18th International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT 2017), Seattle (Aug. 2017), <https://indico.cern.ch/event/567550/timetable/?view=standard_inline_minutes>
* Transformed Lattice Rules for Feynman Loop Integrals, E de Doncker (presenter), A Almulihi, F Yuasa, XXIX IUPAP Conference on Computational Physics, CCP2017, Paris (July 2017), <https://ccp2017.sciencesconf.org>
* Direct Numerical Computation and its Application to the Higher-Order Radiative Corrections, K Kato (presenter), E de Doncker, T Ishikawa and F Yuasa, 18th International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT 2017), Seattle (Aug. 2017)
* Task Partitioning for Bayesian Applications, E de Doncker and A Almulihi (presenter), The 2016 International Conference on Computational Science and Computational Intelligence (CSCI 2016) (Dec. 2016) <http://ieeexplore.ieee.org/document/7881407>
* Automatic Numerical Integration and Extrapolation for Feynman Loop Integrals, E de Doncker (presenter), F Yuasa, K Kato, T. Ishikawa, Invited talk at the Comp. Particle Physics Workshop (CPP’16), Hayama, Japan (Oct. 2016), <http://minami-home.kek.jp/cpp2016/slides/cpp2016-deDoncker.pdf>
* Adaptive Hybrid Multi-threaded Simulation of Agent-Based Pandemic Modeling using Multiple GPUs, B. Shekh (presenter), E. de Doncker and D. Prieto, IEEE International Conf. on Bioinformatics & Biomedicine (BIBM'15) - Workshop on High Performance Computing for Big Data (Nov. 2015), <http://cci.drexel.edu/ieeebibm/bibm2015/index.html>
* Adaptive Integration for 3-loop Feynman Diagrams with Massless Propagators, E. de Doncker (presenter), F. Yuasa, K. Kato, T. Ishikawa and O. Olagbemi, International Conference on Computational Science (ICCS’15), Reykjavik, Iceland (June 2015), [http://meeting.org/iccs2015/wp-content/scheduleSite\_2015/pages/LSCP.html#abstract734](http://iccs-meeting.org/iccs2015/wp-content/scheduleSite_2015/pages/LSCP.html#abstract734)
* Workshop on Large Scale Computational Physics – LSCP, E. de Doncker (presenter) and F. Yuasa, International Conference on Computational Science (ICCS’15), Reykjavik, Iceland (June 2015),

<http://iccs-meeting.org/iccs2015/wp-content/scheduleSite_2015/pages/LSCP.html#abstract757>

* GPGPU Parallelization of Self-Calibrating Agent-Based Influenza Outbreak Simulation. P. Holvenstot (presenter), D. Prieto and E. de Doncker, Proc. High Performance Extreme Computing (HPEC 2014), <http://ieeexplore.ieee.org/document/7041000/>
* Automatic Numerical Methods for Feynman Integrals through 3-loop. E. de Doncker (presenter), F. Yuasa, K. Kato, T. Ishikawa, O. Olagbemi. 16th Workshop on Advanced Computing and Analysis Techniques in Physics (ACAT 2014), Sept. 1-5, 2014, Prague, Czech Republic, <https://indico.cern.ch/event/258092/session/9/contribution/78>, <http://iopscience.iop.org/1742-6596/608/1>
* Scalable Software for Multivariate Integration on Hybrid Platforms. E. de Doncker (presenter), J. Kapenga, F. Yuasa and O. Olagbemi. XXVI IUPAP Conf. on Comp. Physics (CCP 2014), August 11-14, 2014, Boston
* Distributed and multi-core computation of 2-loop integrals, E. de Doncker and F. Yuasa (presenter). 15th International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT 2013), Beijing, China.
* Parallel Paradigms for Experimental Mathematics, E. de Doncker (presenter). Invited talk at the Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, July 2014
* Open Source Software for Monte Carlo/DSMC Applications. E. de Doncker (presenter), J. Kapenga, W. Liou, 55th AIAA/ASMe/ASCE/AHS/SC Structures, Structural Dynamics, and Materials Conference. January 13 - 17,

2014, National Harbor MD

* [Acceleration of loop diagram computations](https://cs.wmich.edu/%7Ehpcs/events/kek13talk.pdf). E. de Doncker. Invited talk at the High Energy Research Organization (KEK), July 2013, Tsukuba, Japan
* Multivariate Integration Algorithms and Applications on GPUs. E. de Doncker and R. Assaf. IV Intl. Congress Comp. Engineering and Sciences (FEMTEC), May 19-24, 2013, Las Vegas NV
* [Parallel Agent-based Simulation of Pandemic and Seasonal Influenza Outbreaks](https://cs.wmich.edu/%7Ehpcs/events/Parallel-Agent-Based-rev.pptx). M. Soto-Ferrari, P. Holvenstot, D. Prieto, E. de Doncker (presenter) and J. Kapenga, at the 13th International Conference on Computational Science (ICCS 2013)**,** June 3-7, 2013, Barcelona, Spain
* [GPU Integral Computations in Stochastic Geometry](https://cs.wmich.edu/%7Ehpcs/events/mctalk.pdf). E. de Doncker (presenter) and R. Assaf. VII Workshop Comp. Geometry and Applics. (CGA)/ XIII ICCSA, June 2013, Ho Chi Minh City
* Feynman Loop Integral Computation on Hybrid Platforms. E. de Doncker, Y. Yuasa (presenter) and R. Assaf, at the 15th International Workshop on Advanced Computing and Analysis Techniques in Physics (ACAT 2013), Beijing, China.
* Adaptive Control in Multi-threaded Integration.E. de Doncker (presenter) and Y. Yuasa. International Conference on Mathematical Modeling in Physical Sciences, September 3-7, 2012, Budapest, Hungary.
* Shared Memory Iterated Integration for Feynman Integrals.E. de Doncker (presenter) and F. Yuasa. XXIV IUPAP Conference on Computational Physics (CCP 2012), June 4-6, 2012, Kobe, Japan
* Multi-core Iterated Adaptive Integration.E. de Doncker, School of Information and Communication Engineering, Beijing University of Posts and Telecommunications, March 26, 2012, Beijing, P.R.C.
* Numerical Integration for Ab Initio Methods in Quantum Chemistry. E. de Doncker, BIT’s 4th Annual World Congress of BioSoft, March 23-25, 2012, Beijing.
* Parallel Computation of Feynman Loop Integrals. E. de Doncker (presenter) and F. Yuasa*.* Conference on Computational Physics (CCP 2011), Oct. 30-Nov. 3, Oakridge National Laboratory (ORNL), Gatlinburg TN
* The GRACE Project – QCD, SUSY, Multi-loop. J. Fujimoto (presenter). N. Hamaguchi, T. Ishikawa, T. Kaneko, Y. Kurihara, S. Odaka, Y. Shimizu, F. Yuasa, T. Inoue, T. Koike, T. Kon, M. Jimbo, K. Kato, M. Kuroda, E. de Doncker. 10th International Symposium on Radiative Corrections (RADCOR 2011), September 26-30, Mamallapuram, India
* Numerical Approach to Multi-loop Integrals. K. Kato (presenter), E. de Doncker, N. Hamaguchi, T. Ishikawa, T. Koike, Y. Kurihara, Y. Shimizu, F. Yuasa. The XXth International Workshop on High Energy Physics and Quantum Field Theory (QFTHEP 2011), September 24-October 1, Sochi, Russia
* Regularization of IR-divergent loop integrals. E. de Doncker (presenter), Y. Yuasa and Y. Kurihara, **14th International Workshop on Advanced Computing and Analysis Techniques in Physics Research** (ACAT 2011), September 5-9, Brunel University, **Uxbridge, London, UK**
* Progress on the Direct Computation Method. F. Yuasa (presenter), T. Ishikawa, N. Hamaguchi, Y. Shimizu , E. de Doncker, K. Kato. **14th International Workshop on Advanced Computing and Analysis Techniques in Physics Research** (ACAT 2011), September 5-9, Brunel University, **Uxbridge, London, UK**
* Parallel Iterated Multivariate Integration. E. de Doncker. International Conference on Computational and Applied Mathematics (ICIAM 2011), July 18-22, Vancouver, Canada
* Numerical Methods for Infrared Divergent One-Loop Diagrams. E. de Doncker, Y. Kurihara, F. Yuasa. International Conference on Computational Science (ICCS 2011), June 1-3, Nanyang Technological University, Singapore
* Computation of Two-loop Integrals with Masses by Numerical Integration and Extrapolation. Y. Yuasa (presenter), T. Ishikawa, N. Hamaguchi, Y. Shimizu, E. de Doncker, K. Kato. LoopFest X, May 12-14, Northwestern University, Il.

**Publications: see below for publications since 2000**

**– for older publications see** <http://www.cs.wmich.edu/elise/vita/node1.html>

* Dynamic Downscaling and Daily Nowcasting from Influenza Surveillance Data, Rajib Paul, Dan Han,

Elise DeDoncker and Diana Prieto, Statistics in Medicine (2022), doi: 10.1002/sim.9502, <https://doi.org/10.1002/sim.9502>

* Regularization of Feynman 4-loop Integrals with Numerical Integration and Extrapolation,

Elise de Doncker and Fukuko Yuasa, Springer Lecture Notes in Computer Science (LNCS), **13378**, pp. 388-405 (2022), <https://link.springer.com/chapter/10.1007/978-3-031-10562-3_28>

* Design and Implementation of an Efficient Priority Queue Data Structure, James Rhodes and Elise de Doncker, Springer Lecture Notes in Computer Science (LNCS), **13378**, pp. 343-537 (2022), <https://link.springer.com/chapter/10.1007/978-3-031-10562-3_25>
* Numerical Regularization for 4-loop Self-Energy Feynman Diagrams, Elise de Doncker, Fukuko Yuasa, Tadashi Ishikawa, Accepted (2022)
* Accuracy of State-Level Surveillance during Emergency Outbreaks of Respiratory Viruses: A Model-Based Assessment, Yuwen Gu, Elise DeDoncker, Richard VanEnk, Rajib Paul, Susan Peters, Gillian Stoltman and Diana Prieto, Medical Decision Making (2021), <https://pubmed.ncbi.nlm.nih.gov/34269123> ,

DOI: 10.1177/0272989X211022276

* Self-Energy Feynman Diagrams with Four Loops and 11 Internal lines, E de Doncker and

F Yuasa, Springer Lecture Notes in Computer Science (LNCS), volume **12953** (2021), pp. 160-175, <https://link.springer.com/chapter/10.1007%2F978-3-030-86976-2_11>

* Unsupervised Learning Model to Uncover Hidden Knowledge from COVID-19 Vaccines Literature,

T Gharaibeh and E de Doncker, in Computational Science and its Applications – ICCSA, Workshop on Advancements in Applied Machine Learning and Data Analytics – AAMDA 2021, Springer International Publishing, ISBN 978-3-030-86959-5 and 978-3-030-86960-1

* Unsupervised Learning with Word Embeddings Captures Quiescent Knowledge from COVID-19 Literature,

T Gharaibeh and E de Doncker, Symposium on Artificial Intelligence (CSCI-ISAI 2020) (Dec. 2020), IEEE, <https://ieeexplore.ieee.org/document/9457998>, DOI 10.1109/CSCI51800.2020.00081,

ISBN 978-1-7281-7624-6

* Large Scale Automatic Computations for Feynman Diagrams with up to Five Loops, E de Doncker, F Yuasa,

O Olagbemi and T Ishikawa, Springer Lecture Notes in Computer Science (LNCS), **12253 (**2020), pp. 145-162, <https://link.springer.com/chapter/10.1007%2F978-3-030-58814-4_11>, doi: [10.1007/978-3-030-58814-4\_11](https://dx.doi.org/10.1007%2F978-3-030-58814-4_11)

* Scalable Algorithms for Multivariate Integration with ParAdapt and CUDA, O Olagbemi and E de Doncker, CSCI 2019, IEEE Xplore, **doi:** [10.1109/CSCI49370.2019.00093](https://doi.org/10.1109/CSCI49370.2019.00093)
* Numerical Multi-Loop Integration on Heterogeneous Many-Core Processors, E de Doncker, F Yuasa,

A Almulihi, N Nakasato, H Daisaka and T Ishikawa, Journal of Physics: Conf. Ser. (JPCS) **1525**, 012002

IOP Series (2019), <https://iopscience.iop.org/article/10.1088/1742-6596/1525/1/012002>

* qSMF: An Approximate Algorithm for Quorum Planted Motif Search on ChiP-Seq Data, H Al-Shaikhli and

E de Doncker, 2019 IEEE International Conference on Electro/Information Technology, IEEE Xplore,

**DOI:** [10.1109/EIT.2019.8834006](https://doi.org/10.1109/EIT.2019.8834006)

* Emotional Awareness based Classification Model for Twitter Sentiment Analysis using a Deep Neural Network, A S M Alharbi and E de Doncker, in 21st International Conference on Artificial Intelligence (ICAI’19), Proc. CSCE 2019, pp. 142-145, ISBN 1-60132-501-0, <https://csce.ucmss.com/cr/books/2019/AuthorsReport?ConferenceKey=ICA>, https://csce.ucmss.com/cr/books/2019/LFS/CSREA2019/ICA2295.pdf
* Changing Energy Consumption Patterns Based on Multi-Agent Human Behavior Modeling for Analyzing the Effects of Feedback Techniques, M Alrizq, E de Doncker and A Fong, In Power and Energy Conference Illinois (PECI), 2019 IEEE, pp. 1-8, <https://ieeexplore.ieee.org/document/8698779>
* Twitter Sentiment Analysis with a Deep Neural Network: An Enhanced Approach using User Behavioral Information, A S M Alharbi and E de Doncker, Cognitive Systems Research **54** (2019), pp. 50-61, <https://doi.org/10.1016/j.cogsys.2018.10.001>
* Efficient GPU Integration for Multi-loop Feynman Diagrams with Massless Internal Lines, E de Doncker,

F Yuasa and A Almulihi, in Computational and Experimental Simulations in Engineering, Mechanisms and Machine Science **75** (2019), pp. 737-747, <https://link.springer.com/chapter/10.1007/978-3-030-27053-7_62>

* Regularization with Numerical Extrapolation for Finite and UV-Divergent Multi-loop Integrals, E de Doncker,

F Yuasa, K Kato, T Ishikawa, J Kapenga, O Olagbemi, Computer Physics Communications **224** (2018),

pp. 164-185, <https://doi.org/10.1016/j.cpc.2017.11.001> ;

Also preprint arXiv:[hep-ph] <https://arxiv.org/abs/1702.04904>

* A Novel Fuzzy Based Human Behavior Model for Residential Electricity Consumption Forecasting, M Alrizq and E de Doncker, 2018 Power and Energy Conference in Illinois (PECI), 2018 IEEE, pp. 1-7, <https://ieeexplore.ieee.org/document/8334984>
* SMF: Approximate Algorithm for the Planted (l, d) Motif Finding Problem in DNA Sequences, H Al-Shaikhli and E de Doncker, Conf. BIOCOMP (Bioinformatics and Computational Biology), pp. 123-129 (2018), ISBN: 1-60132-471-5, <https://csce.ucmss.com/cr/books/2018/LFS/CSREA2018/BIC4274.pdf>
* Accelerating High-Dimensional Integration using Lattice Rules on GPUs, A Almulihi and E de Doncker,

Intl. Conf. on Comp. Science and Comp. Intelligence (CSCI'17), <https://american-cse.org/csci2017>; IEEE Xplore; ISBN-13: 978-1-5386-2652-8; BMS Part # CFP1771X-USB; DOI 10.1109/CSCI.2017.313

* High Speed Evaluation of Loop Integrals using Lattice Rules, E de Doncker, A Almulihi and F Yuasa, Journal of Physics: Conf. Ser. (JPCS) **1085**, 052005, IOP Series (2018), [iopscience.iop.org/article/10.1088/1742-6596/1085/5/052005](http://iopscience.iop.org/article/10.1088/1742-6596/1085/5/052005)
* Direct Numerical Computation and its Application to the Higher-Order Radiative Corrections, K Kato,

E de Doncker, T Ishikawa and F Yuasa, Journal of Physics: Conf. Ser. (JPCS) **1085**, IOP Series (2018), [iopscience.iop.org/article/10.1088/1742-6596/1085/5/052002/pdf](http://iopscience.iop.org/article/10.1088/1742-6596/1085/5/052002/pdf)

* Transformed Lattice Rules for Feynman Loop Integrals on GPUs, E de Doncker, A Almulihi and F Yuasa,

Journal of Physics: Conf. Ser. (JPCS) **1136**, IOP Series (2018), <https://iopscience.iop.org/article/10.1088/1742-6596/1136/1/012002>

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**Teaching Assignments, Course Development**

* Data and File Structures (CS 3310)
* Design and Analysis of Algorithms (CS 4310)
* Parallel Computations (CS 5260)
* Advanced Parallel Computations (CS 6260)
* Theory of Computation I (CS 4800)
* Theory Foundations (CS 5800)
* Advanced Theory of Computation (CS 6800)
* Algorithms (CS 5310)
* Advanced Design and Analysis of Algorithms (CS 6310)
* Advanced Computer Architecture (CS 6250)
* Topics in Computer Science (CS 5950, 6030) – on various topics,

e. g.: CS 6030 Emerging Technologies; CS 5950, 6030 (High Performance) Bioinformatics

* Computer Science Seminar (CS 6910) – various seminars
* Independent Study (CS 5990)
* MS Project (CS 6790)
* MS Thesis (CS 7000)
* Independent Research (CS 7100)
* Professional Field Experience (CS 7120)
* Doctoral Dissertation (CS 7300)
* Doctoral Research (CS 7350)

**Committee Service** (past/ current), incl.

Departmental Committees:  
Graduate Committee (Chair) and Admission Committee (until Fall 2016)  
Tenure and Promotion Committee (and as Chair in 2014-2015, 2018-2019)

Executive Committee

Sabbatical Leave Committee (past)

Graduate Program Review

College Committees:  
College Promotion Committee (Chair)

University Committees (past):

Distinguished Research Scholars Committee

WMU Graduate Program Review Committee

Presidential Commission on Gender Equity