

# Andersen Man Shun Ang

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CONTACT	Department of Combinatorics and Optimization, University of Waterloo, Waterloo, ON, Canada email: ms3ang@uwaterloo.ca      website: angms.science
RESEARCH	<b>Nonnegative Matrix &amp; Tensor Factorization:</b> Algebra, Optimization, Applications
EXPERIENCE AND EDUCATION	<b>University of Waterloo</b> , Waterloo, Canada (Feb. 2021 - Now) Postdoc, supervisors: Stephen Vavasis and Hans De Sterck  <b>Université de Mons</b> , Mons, Belgium (Nov. 2020 - Jan. 2021) Postdoc, supervisor: Nicolas Gillis  <b>Université de Mons</b> , Mons, Belgium (Feb. 2017 - Oct. 2020) Ph.D, Applied mathematics, supervisor: Nicolas Gillis • Thesis: “Nonnegative Matrix and Tensor Factorizations : Models, Algorithms and Applications”  <b>University of Waterloo</b> , Waterloo, Canada (Aug. - Sep. 2019) Visiting student at the Department of Applied Mathematics, Host: Hans de Sterck  <b>University of Hong Kong</b> , Hong Kong (Sep. 2011 - Sep. 2016) M.Phil, Biomedical Engineering (Sep. 2014 - Sep. 2016), supervisors: Y.S. Hung and Z.G. Zhang • Thesis: “Non-negative Matrix and Tensor Factorization with Applications to Feature Extractions” B.Eng, Electronic and Communications Engineering (Sep. 2011 - Aug. 2014), supervisors: Y.S. Hung and Z.G. Zhang • Thesis: “Single Channel Hybrid EEG/EOG-based Brain Computer Interface”
HONORS AND AWARDS	PhD scholarship, European Research Council (Feb. 2017 - Jan. 2021) Travel Award, SIAM OP20 (Apr. 2020) *the conference was canceled due to pandemic Poster hunter award, EURASIP Tensor-Based Signal Processing, KU Leuven (Aug. 2018) Travel Award, XMaths workshop, University deli Studi di Bari Aldo Moro, Italy (Dec. 2017) Travel Award, ALOP Autumn School, Universitat Trier (Jun. 2017) Outstanding Teaching Assistant Award, EEE, the University of Hong Kong (Sep. 2016) Champion, IEEE Computational Intelligence (HK) Postgraduate Paper Contest (Aug. 2016) Postgraduate Scholarships, the University of Hong Kong (Sep. 2014 - Aug. 2016) Best Teaching Assistant Award, EEE, the University of Hong Kong (Sep. 2015) Talent Development Scholarship, Hong Kong Government (Apr. 2015) Champion, IEEE Computational Intelligence (HK) Final Year Project Competition (Aug. 2014) Champion, IEEE EMBS HK-Macau Joint Chapter Student Paper Competition (Aug. 2014) EE72 K.M. Yung Scholarship, EEE, the University of Hong Kong (Oct. 2013) Outstanding Performance Certificates, EEE, University of Hong Kong (Aug. 2012) Research Assistantships and Teaching Assistantships, University of Hong Kong (numerous times)
ACADEMIC EXPERIENCE	<b>University of Waterloo</b> , Waterloo, Canada <span style="float: right;"><b>2021 - now</b></span> <i>Course instructor</i> CO327 Deterministic OR Models (21Spring)

**Université de Mons**, Mons, Belgium **2018 - 2020**  
*Guest lecturer* MARO201 Advanced Optimization, Master level course (18Fall, 19Fall, 20Fall)

**University of Hong Kong**, Hong Kong **2012 - 2016**  
*Head Teaching Assistant*

- ENGG1012 Enhancement Mathematics (12Summer, 14Fall)
- ENGG1002/1111 Computer Programming and Applications (12Fall,13Spring,15 Spring)
- MEDE2203/2500 Biomedical Signals and Linear Systems (13Fall, 14 Fall, 15Fall, 16Fall)
- ELEC2201/3241 Signals and Linear Systems (14Fall)
- ELEC3245/2205 Control and Instrumentation (14Fall, 15Fall, 16Fall)
- ELEC4247/3227 Information Theory and Coding (14Fall, 15Fall)
- CCST9003 Everyday Computing and the Internet (16Fall)

*Course design assistant* **2015 - 2016**  
HKU03x Humanity and Nature in Chinese Thought , A MOOC on ancient Chinese Philosophy, extremely well received with a by-product – a conference paper on MOOC.

*Certificate of Teaching and Learning in Higher Education* (Jan. 2015)  
Centre for the Enhancement of Teaching and Learning, University of Hong Kong

*Research Assistants* **2013 - 2016**

- Technology-Enriched Learning Initiative : On MOOC development. (Sep. - Dec. 2016)
- School of Nursing, Li Ka Shing Faculty of Medicine : On machine learning research on cardiovascular risk assessment. (Sep. 2014 - Aug. 2015)
- Control System Lab, EEE (May. - Aug. 2014)
- Neural Engineering Lab, EEE (Nov. - Dec. 2013)

## PUBLICATIONS

Journal 5, Conference 11, cited-by 155, h-index 7, i10-index 6

### *Preprint Journal papers*

5. **A.M.S. Ang**, J.E. Cohen, N. Gillis, L.T.K. Hien, “Accelerating Block Coordinate Descent for Nonnegative Tensor Factorization”, Submitted to Numerical Linear Algebra with Applications, accepted 2021-02-22, arXiv : 2001.04321, January 2020.
4. V. Leplat, N. Gillis and **A.M.S. Ang**, “Blind Audio Source Separation with Minimum-Volume Beta-Divergence NMF”, IEEE Transaction on Signal Processing. 2020  
DOI: 10.1109/TSP.2020.2991801
3. **A.M.S. Ang** and N. Gillis, “Algorithms and Comparisons of Non-negative Matrix Factorization with Volume Regularization for Hyperspectral Unmixing”, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing 12 (12), pp. 4843-4853, 2019
2. **A.M.S. Ang** and N. Gillis, “Accelerating Nonnegative Matrix Factorization Algorithms using Extrapolation”, Neural Computation 31 (2), pp. 417-439, 2019.
1. J.F. Wu, **A.M.S. Ang**, Z.G. Zhang, K.M. Tsui, H.C. Wu, Y.S. Hung, S.C. Chan, “Efficient Implementation and Design of A New Single-Channel Electrooculography-based Human-Machine Interface System” ,IEEE TCAS II 62(2), 2015.

### *Conference papers*

11. **A.M.S. Ang**, V. Leplat, N. Gillis, “Fast algorithm for complex-NMF with application to source separation”, EUSIPCO21, 23-27 August, 2021.
10. O. V. Thanh, **A.M.S. Ang**, N. Gillis, L.T.K. Hien, “Inertial Majorization-Minimization Algorithm for Minimum-Volume NMF”, Submitted to Numerical Linear Algebra with Applications, EUSIPCO21, 23-27 August, 2021.
9. **A.M.S. Ang**, N. Gillis, A. Vandaele, H. De Sterck, “Nonnegative Unimodal Matrix Factorization”, October 2020. Accepted by ICASSP2021.

8. **A.M.S. Ang**, J.E. Cohen, L.T.K. Hien and N. Gillis, “Extrapolated Alternating Algorithms for Approximate Canonical Polyadic Decomposition”, ICASSP 2020, May 4-8, 2020
7. Valentin Leplat, Nicolas Gillis, Xavier Siebert, **A.M.S. Ang**, “Sparation aveugle de sources sonores par factorization en matrices positives avec pnalité sur le volume du dictionnaire”, GRETSI 2019, Aug. 26-29, 2019, Lille, France.
6. **A. Ang**, J.E. Cohen, N. Gillis, “Accelerating Approximate Nonnegative Canonical Polyadic Decomposition using Extrapolation”, GRETSI 2019, Aug. 26-29, 2019, Lille, France
5. V. Leplat, **A.M.S. Ang**, N. Gillis, “Minimum-Volume Rank-Deficient Nonnegative Matrix Factorizations”, ICASSP 2019, May 12-17, 2019, Brighton, UK
4. **A.M.S. Ang** and N. Gillis, “Volume regularized Non-negative Matrix Factorizations”, IEEE WHISPERS 2018, Sep. 23-26, 2018, Amsterdam, Netherlands.
3. C.U. Lei, Y.C.A. Yeung, T.T.O. Kwok, R. Lau and **A. Ang**, “Leveraging videos and forums for small-class learning experience in a MOOC environment”, IEEE TALE 2016, Dec. 7-9, 2016, Bangkok, Thailand.
2. **A.M.S. Ang**, Y.S. Hung, Z. Zhang, “A Non-negative Tensor Factorization Approach to Feature Extraction for Image Analysis”, IEEE DSP 2016, Oct. 16-18, 2016, Beijing, China.
1. **A.M.S. Ang**, Z.G. Zhang, Y.S. Hung and J.N.F. Mak, “A User-friendly Wearable Single-channel EOG-based Human-Computer Interface for Cursor Control”, IEEE/EMBS NER2015, Apr. 22-24, 2015, Montpellier, France.

**Conference session chair:** SIAM CSE21, SIAM LA21

**Conference presentation:** SIAM CSE21, ICCOPT19, ISMP18, SIAM LA18

OTHER  
PROFESSIONAL  
EXPERIENCE

**Reviewer**

- Journals: IEEE TIT, IEEE TSP, IEEE TCAS II, IEEE COMMUN LETT, J. Sci. Comput.
- Conferences: IEEE ICASSP 2020 - 2021, IEEE DSP 2015-2017

*Member:* SIAM, IEEE

*Summer Intern* Geotechnical Engineering Office, CEDD, HK Government **Jun. - Aug. 2013**  
Image Database System and UI enhancement for slope stability monitoring and landslide prevention

LANGUAGE

- Human: English(professional, IELTS 7.5, 2013), Cantonese(native), Mandarin(good), French(beginner)
- Computer: MATLAB(professional), L<sup>A</sup>T<sub>E</sub>X(professional), C++(good)

REFEREES

*Academic Referees*

- Nicolas Gillis `nicolas.gillis@umons.ac.be`  
Associate Professor, Dept. Mathematics and Operation Research, Université de Mons, Belgium.
- Hans De Sterck `hdesterck@uwaterloo.ca`  
Professor, Dept. Applied Mathematics, University of Waterloo, Canada.

*Professional Referee*

- Michael Kwok-Po Ng `mng@maths.hku.hk`  
Chair professor, Dept. Mathematics, University of Hong Kong, Hong Kong.
- Ricky Yu-Kwong Kwok `Ricky.Kwok@hku.hk`  
Professor, Associate Vice-President, University of Hong Kong, Hong Kong.

**End of CV** (Last update May 4, 2021)