

CURRICULUM VITAE

Thierry Chekouo T., PhD

Occupation : Assistant Professor
Address : Division of Biostatistics
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RESEARCH INTERESTS :

Bayesian statistics, Clustering and bi-clustering, Computational statistics, High-Dimensional data, Variable selection, Omics data integration, Imaging-Genetics.

EDUCATION

- 2013 Ph.D.** in Statistics, University of Montreal, Canada.
Supervisor : Alejandro Murua.
- 2007 M.Sc** in Statistics and Economics, Upper National School of Statistics and Applied Economics (ENSEA), Abidjan, Cote d'Ivoire.
- 2004 M.Sc** in Mathematics, option Algebra, University of Yaounde I, Cameroon.
- 2004 Teaching Diploma for Secondary and High School Education** (Grades 9 to 12) in Mathematics, Higher Teachers' Training College, University of Yaounde I, Cameroon.
- 2001 B.Sc** in Mathematics, University of Yaounde I, Cameroon.

ACADEMIC POSITIONS

- August 2022 - present** Assistant professor of Biostatistics, School of Public Health, University of Minnesota.
- February 2019 - present** Adjunct Assistant Professor, Department of Biochemistry & Molecular Biology, and Mathematics and Statistics, University of Calgary.
- July 2018 - August 2022** Assistant professor of Biostatistics, Department of Mathematics and Statistics, University of Calgary.
- August 2016 - June 2018** Assistant professor of Statistics, Department of Mathematics and Statistics, The University of Minnesota Duluth.
- February 2013 - August 2016** Postdoctoral Fellow, Department of Biostatistics, The University of Texas MD Anderson Cancer Center, Houston, TX.
Mentors : **Dr Kim-Anh Do & Dr Francesco Stingo**

PAPERS

A. Published Papers

1. Xiaotian Dai, David Champredon, Aamir Fazil, Chand S. Mangat, Shelley W. Peterson, and Edgard M. Mejia, Xuewen Lu, and **Thierry Chekouo**. *Statistical framework to support the epidemiological interpretation of SARS-CoV-2 concentration in municipal wastewater*. Scientific Reports, 12, 13490 (2022). <https://doi.org/10.1038/s41598-022-17543-y>
2. Nicole Acosta, María A. Bautista, Barbara J. Waddell, Janine McC Calder, Alexander Buchner Beaudet, Lawrence Man, Puja Pradhan, Navid Sedaghat, Chloe Papparis, Andra Bacanu, Jordan Hollman, Alexander Krusina, Danielle A. Southern, Tyler Williamson, Carmen Li, Srijak Bhatnagar, Sean Murphy, Jianwei Chen, Darina Kuzma, Rhonda Clark, Jon Meddings, Jia Hu, Jason L. Cabaj, John M. Conly, Xiaotian Dai, Xuewen Lu, **Thierry Chekouo**, Norma J. Ruecker, Gopal Achari, M. Cathryn Ryan, Kevin Frankowski, Casey R.J. Hubert, Michael D. Parkins (2022), *Longitudinal SARS-CoV-2 RNA wastewater monitoring across a range of scales correlates with total and regional COVID-19 burden in a well-defined urban population*, Water Research, 220,118611, <https://doi.org/10.1016/j.watres.2022.118611>.
3. Danika Lipman, Sandra Safo and **Thierry Chekouo** (2022). *Multi-omic analysis reveals enriched pathways associated with COVID-19 and COVID-19 severity*. Plos One. <https://doi.org/10.1371/journal.pone.0267047>
4. Meng Wang, Tolulope T. Sajobi, Zahinoor Ismail, Dallas Seitz, **Thierry Chekouo**, Nils D. Forkert, Karyn Fischer, Aaron Mackie, Dawn Pearson, David Patry, Alicja Cieslak, Bijoy Menon, Philip Barber, Brienne McLane, Robert Granger, David B. Hogan, Eric E. Smith. (2022). *A pragmatic dementia risk score for patients with mild cognitive impairment in a memory clinic population : development and validation of a dementia risk score using routinely collected data*. Alzheimer's & Dementia : The Journal of the Alzheimer's Association. <https://doi.org/10.1002/trc2.12301>
5. Weibing Li and **Thierry Chekouo**. (2022). *Bayesian Group Selection With Non-Local Priors*. Computational Statistics. 37 : 287–302. <http://dx.doi.org/10.1007/s00180-021-01115-1>
6. Xin Chen, Qingrun Zhang and **Thierry Chekouo** (2021). *Filtering high-dimensional methylation marks with extremely small sample size : an application to gastric cancer data*. Frontier in Genetics, Computational Genomics. <http://dx.doi.org/10.3389/fgene.2021.705708>
7. **Thierry Chekouo** and Sandra E. Safo. (2021). *Bayesian Integrative Analysis and Prediction with Application to Atherosclerosis Cardiovascular Disease*. Biostatistics, <http://dx.doi.org/10.1093/biostatistics/kxab016>
8. Meng Wang, Eric Smith, Nils Daniel Forkert, **Thierry Chekouo**, Zahinoor Ismail, Aravind Ganesh and Tolu Sajobi. (2021). *Integrating expert knowledge for dementia risk prediction in individuals with mild cognitive impairment (MCI) : a study protocol*. BMJ Open. <http://dx.doi.org/10.1136/bmjopen-2021-051185>
9. Eric Jeffords, Samuel Freeman, Breanna Cole, Kate Root, **Thierry Chekouo**, Richard G Melvin, Lynne Bemis and Glenn E Simmons Jr. (2020). *Y-box binding protein 1 acts as a negative regulator of stearyl CoA desaturase 1 in clear cell renal cell carcinoma*. Oncology Letters. 20 : 165.

10. **Thierry Chekouo**, Shariq Mohammed and Arvind Rao. (2020). *A Bayesian 2D Functional Linear Model for Gray-Level Co-occurrence Matrices in Texture Analysis of Lower Grade Gliomas*. NeuroImage : Clinical. 18 : 102437.
11. **Thierry Chekouo** and Alejandro Murua (2018), *High-dimensional Variable Selection with the Plaid Mixture Model for Clustering*, Computational Statistics. Vol 33, No 3, 1475-1496.
12. **Thierry Chekouo**, Francesco C. Stingo, Caleb Class, Yuanqing Yan, and al (2017), *Investigating Protein Patterns in Human Leukemia Cell Line Experiments : A Bayesian Approach for Extremely Small Sample Sizes*. Submitted to Statistical Methods in Medical Research, Vol 29, No 4, 1181-1196.
13. **Thierry Chekouo**, Francesco Stingo, Michele Guindani and Kim-Anh Do (2016), *A Bayesian predictive model for imaging genetics with application to schizophrenia*, The Annals of Applied Statistics. Vol. 10, No. 3, 1547-1571.
14. **Thierry Chekouo**, Francesco C. Stingo, James D. Doecke and Kim-Anh Do (2016), *A Bayesian integrative approach for multi-platform genomics data : a kidney cancer case study*, Biometrics, Vol 73, Issue 2, pages 615-624.
15. **Thierry Chekouo**, Francesco C. Stingo, James D. Doecke and Kim-Anh Do (2015), *miRNA-Target Gene Regulatory Networks : A Bayesian Integrative Approach to Biomarker Selection with Application to Kidney Cancer*, Biometrics, Vol. 71, Issue 2, pages : 428-438.
16. **Thierry Chekouo** and Alejandro Murua (2015), *The Penalized Biclustering model and Related Algorithms*, Journal of Applied Statistics, vol. 42, issue 6, pages 1255-1277.
17. **Thierry Chekouo**, Alejandro Murua and Wolfgang Raffeisberger W. (2015), *The Gibbs-plaid Biclustering Model*, The Annals of Applied Statistics, Vol. 9, No. 3, 1643-1670.
18. James D. Doecke, **Thierry T. Chekouo**, Francesco Stingo and Kim-Anh Do (2014) *miRNA target gene identification : Sourcing miRNA target gene relationships for the analyses of TCGA illumina MiSeq and RNA-Seq hiseq platform data*, International Journal of Human Genetics. 14(1) :17-22.

D. Theses

19. Modeling of biclusters and variable selection in high dimensional data : application to gene expression data, *Ph.D Thesis*, November 2012, Supervisor : **Dr. Alejandro Murua**, University of Montreal.
20. Macro-econometric analysis of monetary bloc and the balance of payments bloc, Master's Degree thesis in Statistics and Economics, October 2006, Supervisor : **Amal Mansouri**, INAC, Morocco.
21. Universal Bialgebras, Master's Degree thesis in Mathematics, July 2004, Supervisor : **Nkuimi Celestin**, University of Yaounde I.
22. Around Transition Systems, Higher Teachers' Training College thesis, June 2003. Supervisor : **Nkuimi Celestin**, University of Yaounde I.

TRAINEE SUPERVISION

A. Primary Supervision or Co-supervision

May 2021-April 2023 Xiaotian Dai, Postdoctoral fellow, co-supervisor : *Machine learning models for genomics data*, University of Calgary

March 2020-May 2021 Xiaoming Lu, Postdoctoral fellow, co-supervisor : *Joint Modeling of Competing risk and longitudinal data*, University of Calgary

September 2022-August 2026 Ariel Kemogne, PhD Student, Graduate supervisor : *Bayesian approaches for Omics data*, University of Calgary

September 2022-August 2024 Adeepa Gunarathne, M.S Student, Graduate supervisor : *Bayesian variable selection approaches*, University of Calgary

September 2021-August 2023 Dani Lipman, M.S Student, Graduate supervisor : *Nonlinear Bayesian variable selection for semicontinuous response*, University of Calgary

September 2021-August 2023 Tim Biziaev, M.S Student, Graduate supervisor : *Bayesian validation models*, University of Calgary

January 2020-December 2022 Samuel Babatunde, M.S Student, Graduate supervisor : *Bayesian biomarker selection for semicontinuous responses. Application to cardiovascular disease*, University of Calgary

Mai 2019-August 2020 Xin Chen, M.S Student, Graduate supervisor : *The application of a Bayesian approach to detect differential methylation expression*, University of Calgary

May 2022-August 2022 Jinsu An, Undergraduate supervision, *Statistical analysis for single cell RNA-seq data.*, Program for Undergraduate Research Experience (PURE), University of Calgary.

May 2020-August 2020 Yair Guterman, Undergraduate supervision, *Prediction of survival time using molecular subtypes obtained from gene expression data : Application to lung cancer data.*, Program for Undergraduate Research Experience (PURE), University of Calgary.

May 2019-August 2019 Andrew Symes, Undergraduate supervision, *Informed Protein Modification Through the Use of Functional Principal Component Analysis on Molecular Dynamics Simulation Data*, Program for Undergraduate Research Experience (PURE), University of Calgary.

March 2018-January 2019 Himadri Mukherjee, M.S Student, Graduate supervisor : *Application of Hidden Markov model to Model based clustering and Variable selection*, University of Minnesota Duluth

May 2017-August 2018 Weibing Li, M.S Student, Graduate supervision : *Bayesian group selection with non-local priors*, University of Minnesota Duluth

May 2017-August 2018 Deepali Gupta, M.S Student, Graduate supervision : *A Bayesian Hidden Markov model for DNA Methylation data*, University of Minnesota Duluth

Spring 2018 Kaiwen Han, B.Sc student, Undergraduate supervision : *Ordinal Logistic Regression Analysis of Lung Cancer Stages Based on Gene Expression Data*, University of Minnesota Duluth

Fall 2017 Shuning Jin, B.Sc student, Undergraduate supervision : *Gene Selection for Survival Data with application to Glioblastoma*, University of Minnesota Duluth

Spring 2017 Xiang He, B.Sc student, Undergraduate supervision : *Clustering Analysis of gene expression data and application to kidney cancer*, University of Minnesota Duluth

RESEARCH SUPPORT

1. Funding Agency : Natural Sciences and Engineering Research Council (NSERC).
Principal investigator : Thierry Chekouo
Title : Bayesian integrative approaches for high-dimensional imaging and genomic data
Amount : \$115000, 2019-2023
2. Funding Agency : Public Health Agency of Canada (PHAC).
Principal investigator : Thierry Chekouo
Co-investigator : Xiaotian Dai ; Xuewen Lu
Title : Statistical Modelling of SARS-COV-2 RNA Concentration in Wastewater, Contract
Amount : \$24750, July 2021-December 2021
3. Funding Agency : University of Calgary.
Principal investigator : Thierry Chekouo
Co-applicant : Jason de Koning ; Xuewen Lu
Title : Advanced statistical methods for differential transcriptome analysis in COVID-19
Amount : \$14,000, August 2020-August 2021
4. Funding Agency : Tri-Agency : Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council (NSERC), and Social Sciences and Humanities Research Council (SSHRC)
Principal Investigator : Dr Quan Long,
Co-Investigator : pei Wang, Paul Gordon, Derrick Rancourt, Steven Greenway, Qingrun Zhang, Ping-Yee Au, **Thierry Chekouo**, Xi-Long Zheng,
Title : *Developing a Machine Learning Framework for Medical Genomic Projects with Small or Moderate Sample Sizes*
Amount : \$250000, 2019-2021

TEACHING AT THE UNIVERSITY OF CALGARY

Semester	Course	Title	# Students
Winter 2022	STAT 619	Bayesian statistics	15
Winter 2022	STAT 505	Time series Analysis	50
Fall 2021	DATA 691	Topics in data science and Analytics (Time Series Analysis)	47
Spring 2021	DATA 691	Topics in data science and Analytics (Time Series Analysis)	40
Winter 2021	STAT 505	Time series Analysis	40
Fall 2020	DATA 603	Statistical Modelling with Data	30
Fall 2020	STAT 635	Generalized Linear model	10
Winter 2020	STAT 505	Time series Analysis	50
Winter 2020	STAT 619	Bayesian statistics	15
Fall 2019	DATA 603	Statistical Modelling with Data	22
Winter 2019	STAT 217	Intro. to Statistics II	107
Winter 2019	STAT 505	Time series Analysis	30

TEACHING AT THE UNIVERSITY OF MINNESOTA DULUTH

Semester	Course	Title	# Students
Spring 2018	STAT 4060	Intro. to Biostatistics	15
Spring 2018	STAT 5531	Probability Models (Stochastic Proc.)	16
Fall 2017	STAT 5531	Probability Models (Stochastic Proc.)	29
Fall 2017	STAT 3611	Introduction to Probability and Statistics	34
Spring 2017	STAT 5531	Probability Models (Stochastic Proc.)	15
Spring 2017	STAT 3611	Introduction to Probability and Statistics	35
Fall 2016	STAT 3611	Introduction to Probability and Statistics	35

OTHER TEACHING EXPERIENCE

January 2011 - April 2011 Lecturer, Forecasting methods (STT 3220, B.Sc. course), Data Analysis with SAS, University of Montreal, Montreal, Canada.

May 2010 - July 2010 Lecturer, Survival analysis (STT 3260, B.Sc. course), Data Analysis with SAS and R, University of Montreal, Montreal, Canada.

September 2008 - August 2012 Teaching Assistant (B.Sc. courses : MAT2600 : Algebra II, MAT1500 : Discrete mathematics, STT1971 : Introduction to Statistics, STT1700 : Introduction to Statistics, STT3260 : Survival analysis, STT2400 : Linear Regression), Data Analysis with SAS, R and Excel, Department of Mathematics and Statistics, University of Montreal, Canada.

May 2008 - August 2008 Lecturer (Microeconomics, M.Sc. course), Deputy Regional Institute of Statistics and Applied Economics (ISSEA), Yaounde, Cameroon.

October 2007 - August 2008 Lecturer (M.Sc. courses : Data Analysis, Econometrics), Faculty of Social Sciences and Management, Catholic University of Central Africa, Cameroon.

OTHER EXPERIENCE

September 2008 - April 2009 Statistical Consulting Service of the University of Montreal : communication skills and identification of the statistical procedures that are most commonly used in consulting ; hands-on experience in consulting, meetings with professionals from various sectors and resolution of their statistical problems. Tools : SAS, SPSS, SPLUS, Excel.

September 2009 - December 2009 Research Internship, The Swiss Federal Institute of Technology of Lausanne (EPFL), Switzerland.

August 2006 - October 2006 Academic Internship, High Commissioner for Planning, National Institute of Analysis of Economic Conditions (INAC), Morocco.

INVITED AND CONTRIBUTED TALKS

January 31, 2022 *Integrative Bayesian Methods for Omics and Imaging Data : Application to Cardiovascular and Glioblastoma Diseases.* Division of Biostatistics, School of Public Health, University of Minnesota, Invited talk, oral presentation.

June 24-26, 2021 *A Bayesian 2D functional linear model : Application to GLCM matrices in LGG cancer radiomics data..* 4th International Conference on econometrics and Statistics (EcoSta 2021), HKUST, Hong Kong, Invited talk, oral presentation.

October 15, 2020 *A Bayesian 2D Functional Linear Model for Gray-Level Co-occurrence Matrices in Texture Analysis of Lower Grade Gliomas.* Department of Mathematics and Statistics, Colloquium Series 2020-2021, University of Calgary, Calgary, Canada, Invited talk, oral presentation.

October 5, 2020 *Integrative Bayesian methods for radiomics and other omics data : Applications to lower grade glioma cancer and cardiovascular diseases.* Alberta Children's Hospital Research Institute : Child Health and Wellness Seminars, Calgary, Canada, Invited talk, oral presentation.

August 2-6, 2020 *A Bayesian 2D Functional Linear Model : Application to GLCM Matrices in LGG Cancer Radiomics Data.* Virtual Joint statistical meeting of the American Statistics association, United States, Invited talk, oral presentation.

December 13, 2019 *Integrative Bayesian statistical approaches for omics cancer data.* Community Health Sciences & O'Brien Institute Seminar, Canada, Invited talk, oral presentation.

February 16-17, 2019 *Data Science Applications in Biostatistics : a focus on integrative Analysis in Biomedical ; Data Science.* Society for Industrial and Applied Mathematics (SIAM) Data Science of the University of Calgary, Canada, Invited talk, oral presentation.

July 2019 *Bayesian Group Selection for Compositional Data : Application to Radiomic data in Glioblastoma disease.* IMS-China International Conference on Statistics and Probability, China

- July 6-10, 2019** . Bayesian Group Selection for Compositional Data : Application to Radiomic data in Glioblastoma disease. International Chinese Statistical Association (ICSA) and Nankai University, China, Invited talk, oral presentation.
- December, 2019** *Bayesian integrative Analysis method with incorporation of grouping information.* The international Indian Statistical Association (IISA) 2019, Mumbai, India, Invited talk, oral presentation.
- May, 2019** *Model-Based Clustering and Gene Selection via Bayesian Hierarchical Hidden Markov Models.* Statistical Society of Canada (SSC)., Canada
- September 2018** *Bayesian Group Selection for Compositional Data : Application to Radiomic data in Glioblastoma disease.* 40th Annual Meeting of Alberta Statisticians, Edmonton, Canada, Invited talk, oral presentation.
- October 4-7, 2018** *Bayesian Factor Analysis Regression with Incorporation of Grouping Information.* International Conference on Advances in Interdisciplinary Statistics and Combinatorics, Greensboro (NC), United States, Invited talk, oral presentation.
- September 29, 2018** *Bayesian Group Selection for Compositional Data : Application to Radiomic data in Glioblastoma disease,* 40th Annual Meeting of Alberta Statisticians, Calgary, Invited talk, oral presentation.
- June 24-29, 2018** *Bayesian Group Selection for Compositional Data : Application to Radiomic data in Glioblastoma.* 2018 World Meeting of the International Society for Bayesian Analysis (ISBA), Edinburgh, United Kingdom, Poster presentation.
- August 16-20, 2017** *Investigating Protein Patterns in Human Leukemia Cell Line Experiments : A Bayesian Approach for Extremely Small Sample Sizes,* Bayesian Inference in Statistics and Statistical Genetics, The Third Annual Kliakhandler Conference, Michigan Technological University, Houghton, Michigan. Invited talk, oral presentation.
- June 14-17, 2015** *A Bayesian Approach for Pattern Detection in Extremely Small Sample Sizes : Application to Proteomic Cell Line Data of Human Leukemia,* Bayesian Methods and Applications, 2017 Annual meeting in Winnipeg of the Statistical Society of Canada (SSC), oral presentation.
- July 30 - August 4, 2016** *A Bayesian Approach for the Integrative Analysis of Omics Data,* Biometrics section, 2016 Joint Statistical Meetings (JSM) in Chicago. Biometric section, Bayesian Analysis with Health Applications, oral presentation.
- June 12-15, 2016** *A Bayesian approach for the integrative analysis of omics data : A kidney cancer case study,* 2016 International Chinese Statistical Association (ICSA) Applied Statistical Symposium, Atlanta, Georgia, invited talk, oral presentation.
- April 8-9, 2016** *A Bayesian approach for the integrative analysis of omics data : A kidney cancer case study,* The 2016 Conference of Texas Statisticians (COTS), Trinity University, invited talk, oral presentation.

- March 1st, 2016** *A Bayesian approach for the integrative analysis of omics data : A kidney cancer case study*, Department of Mathematics and Statistics, University of Minnesota Duluth, invited talk, oral presentation.
- February 11, 2016** *A Bayesian approach for the integrative analysis of omics data : A kidney cancer case study*, Department of Statistics, University of Manitoba, invited talk, oral presentation.
- November 17, 2015** *A Bayesian approach for the integrative analysis of omics data : A kidney cancer case study*, Department of Epidemiology, Biostatistics and Occupational health, McGill University, special seminar, invited talk, oral presentation.
- November 1-3, 2015** *A Bayesian Predictive Model for Imaging Genetics with Application to Schizophrenia*, iBRIGHT : Integrative Biostatistics Research for Imaging, Genomics, & High-throughput Technologies in Precision Medicine. Conference organized by MD Anderson Cancer Center, poster presentation.
- August 8-13, 2015** *A Bayesian Predictive Model for Imaging Genetics with Application to Schizophrenia*, Biometrics section, 2015 Joint Statistical Meetings (JSM) in Seattle. Biometric section, Bayesian Methods in Genetics and Genomics, oral presentation.
- June 14-17, 2015** *A Bayesian Predictive Model for Imaging Genetics with Application to Schizophrenia*, Statistical Science for Genetics and Genomics section, 2015 Annual meeting in Halifax of the Statistical Society of Canada (SSC), oral presentation.
- August 2-7, 2014** *A Bayesian Approach to Biomarker Selection Through MiRNA Regulatory Network with Application to Kidney Cancer*, Biometrics section, 2014 Joint Statistical Meetings (JSM) in Boston, oral presentation.
- May 25-28, 2014** *A Bayesian Approach to Biomarker Selection Through MiRNA Regulatory Network with Application to Kidney Cancer*, Biostatistics section, 2014 Annual meeting in Toronto of the Statistical Society of Canada (SSC), oral presentation.
- February 12-14, 2014** *miRNA-Target Gene Regulatory Networks : A Bayesian Integrative Approach to Biomarker Selection with Application to Kidney Cancer*, Biostatistics section, 2014, 7th Annual Bayesian Biostatistics and Bioinformatics Conference. Conference organized by MD Anderson Cancer Center, poster presentation.
- August 3-8, 2013** *Variable Selection with Overlapping Clustering*, section : Statistical Learning and Data Mining, 2013 Joint Statistical Meetings (JSM) in Montreal, Invited talk, oral presentation.
- May 26-29, 2013** *Variable Selection With Overlapping Clustering*, section : Clustering and Classification, 2013 Annual meeting in Edmonton of the Statistical Society of Canada (SSC), oral presentation.
- June 3-6, 2012** *The Gibbs-plaid Biclustering Model*, section : Studying Gene Expression/Association, 2012 Annual meeting in Guelph of the Statistical Society of Canada (SSC), oral presentation.

May 23, 2012 *The Gibbs-plaid Biclustering Model*, Seminar for graduate students, University of Waterloo, Invited talk, oral presentation.

May 11, 2012 *The Gibbs-plaid Biclustering Model*, Seminar for graduate students, University of Montreal, oral presentation.

December 11-16, 2011 *The penalized plaid biclustering model*, Current Challenges in Statistical Learning organized by the Banff International Research Station for mathematical Innovation and Discovery (BIRS), Invited talk, oral presentation.

May 12-15, 2011 *Statistical View of Popular Biclustering Algorithms*, section : High-Dimensional Data in Biology, 2011 Annual meeting in Wolfville of the Statistical Society of Canada (SSC), oral presentation.

COMPUTER KNOWLEDGE

- Programming languages : Java, C/C++, Visual-Basic, SQL.
- Statistical software : R, S-PLUS, SAS, Stata, Eviews, SPSS, SPAD, MATLAB, WinBugs, Stan.
- Other software : Excel, LaTeX, Word, Access, Microsoft PowerPoint.
- Operating systems : Linux, Windows, MacOS.