

JEROME CHARTON

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Age: 41 / Nationality: French

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WORK EXPERIENCE

Massachusetts General Hospital / Harvard Medical School - Center for Advanced Medical Computing and Analysis (CAMCA) 2021 - Present

Instructor of Investigation Boston - MA - USA

- Supervisor: PROFESSOR QUANZHENG LI.
- Topic: Machine learning / Deep learning applied to medical data analysis.
 - Autonomous Robotic System with patient, using 3D human pose detection.
 - Wearable Eye Tracker accuracy improvement using AI networks.
 - Echocardiography view classification and ejection fraction estimation.
 - Patient classification using ML/DL over tabular data and multiple modalities.

University of Iowa - Visual Intelligence Laboratory

2019 - 2021

Adjunct Assistant Professor of Industrial and Systems Engineering

Assistant Research Scientist at the Center for Computer-Aided Design

Iowa City - IA - USA

- Supervisor: PROFESSOR STEPHEN BAEK.
- Topic: A new hierarchical segmentation of the brain based on the genome, an evaluation of the impact of crystal voids on their explosion, a study of human behavior in hospitals using autonomous acquisition systems, a closed peer-to-peer network federating deep learning, observation of human labor used to with a tracking pose on board Jetson Nano.

Kyung Hee Dental University Hospital

2019

Research Scientist

Seoul - Korea

- Supervisor: PROFESSOR JUNGWOO LEE.
- Topic: Development of tools for the virtual planning of skull correction and facial plastic surgeries.

KIST (Korea Institute of Science & Technology) - Center for Bionics team

2015 - 2019

Post-doc

Seoul - Korea

- Supervisor: YOUNGJUN KIM.
- Topic: Mesh processing for Virtual Surgical Planning.

Design of robust and accurate mesh operations such as complex Boolean operations and mesh re-pairing on synthetic, reconstruction, and acquired data for medical application.
- Fund: KRF/NRF (Korea Research Fellowship/National Research Foundation of Korea)
<https://www.nrf.re.kr/eng/main>

University of Bordeaux - LaBRI (UMR-5800) - Image & Sound research team 2011 - 2014

PhD Student / Assistant teacher

Bordeaux - France

- Subject: 3D Acquisition, reconstruction and fast prototyping of discrete surfaces by estimation of shape saliency characteristics.
With two applications:
 - 3D Facial reconstitution from skull land marks.
 - Virtual Surgical Planning for maxillofacial surgery using 3D printing technology.
- PhD graduation obtained December 16th 2014.

University of Bordeaux - LaBRI Transfert

2008-2010

Research Engineer

Bordeaux - France

- **Project Terahertz:** redesign and improvement of a prototype of software to create QTerahertz. QTerahertz is a software of visualisation of terahertz images. Implementation of a new architecture in collaboration with the laboratory of physics research of Bordeaux (LOMA UMR 5798). Developed in C++/Qt/OpenGL.
- **Project Simbals:** analysis and development of a music recognition software from singing. It uses pitch extraction and sequence comparison algorithms implemented in LaBRI. Developed in Java/C++ uses technology JNA and hibernate with QtJambi interface.
- **Project Moz'art:** analysis and development of a library and a mosaic creation software according to an innovative process, in collaboration with the company NOVALTESS. Developed in C++/Qt.
- **Project QIse:** Implementation of a Qt-plugin mechanism in an image segmentation software QIse (LaBRI). Comparison of existing image libraries, in order to replace the current implementation. Development of new interactive tools for drawing segmentation on 2D images.

Nextraining.net

2005-2008

Software Engineer

75011 Paris - France

- Website development for finance training. Developed in PHP/MySQL. Installation and administration of internal networks using Linux systems. Interaction with customers IT services.

EDUCATION

Doctor degree in Computer Science
(*Speciality Computer Graphics*)

2011 - 2014

University of Bordeaux - France

Master degree in Computer Science
(*Speciality Software Engineer*)

2006 - 2008

University of Bordeaux - France

Bachelor degree in Computer Science

2003 - 2006

University of Bordeaux - France

Scientific Baccalaureate
(*Biology - Mathematics - Physics*)

1999 - 2002

Lycee Pierre Larousse - Toucy - France

SKILLS

Languages	French (mother tongue), English (fluent), German (intermediate), Korean (beginner)
Software engineer	Design Patterns, UML
Programming Languages	C, C++, Java, Python, php, script-shell, C#, Lisp
Operating Systems	Linux, MacOS, Windows
Data base	MySQL, SQLite, Oracle, PostgreSQL
Tools	git, SVN, Emacs, Eclipse, Visual Studio, Latex, Qt, OpenGL

International Professional Journal (1.1)

Assessment of valve regurgitation severity via contrastive learning and multi-view video integration. - S. Kim, H. Ren, **J. Charton**, J. Hu, C.A. Maraboto Gonzalez, J. Khambhati, J. Cheng, J. DeFrancesco, A.A. Waheed, S. Marciniak, F. Moura, R.N. Cardoso, B.B. Lima, S. McKinney, M.H. Picard, X. Li, Q. Li - Physics in Medicine and Biology, 9 pages, Article long, DOI: 10.1088/1361-6560/ad22a4., Impact Factor 3.3, Feb. 2024.

Mesh repairing using topology graphs. - **J. Charton**, S. Baek, Y.J. Kim - Journal of Computational Design and Engineering, Volume 8, Issue 1, Pages 251–267, Impact Factor 6.35, Feb. 2021.

ZerNet: Convolutional Neural Networks on Arbitrary Surfaces Via Zernike Local Tangent Space Estimation. - Z. Sun, E. Rooke, **J. Charton**, Y. He, J. Lu, S. Baek - Computer Graphics Forum, 39(6): Pages 204-216, Impact Factor 3.23, Feb. 2020.

Boolean operations by a robust, exact, and simple method between two colliding shells. - **J. Charton**, L.H. Kim, Y.J. Kim - Journal of Advanced Mechanical Design, Systems, and Manufacturing, SCIE journal, Impact Factor 0.8, Sept. 2017.

3D Boolean operations in virtual surgical planning. - **J. Charton**, M. Laurentjoye, Y.J. Kim - International Journal Computer Aided Radiology and Surgery, Impact Factor 3.42, July 2017.

Orthognathic mandibular osteotomy and condyle positioning: update and innovation - M. Laurentjoye, **J. Charton**, and M.J. Boileau - L'Orthodontie Française 86 (1), pages 73–81, Impact Factor 0.23, 2015.

Mandibular surgery planning and 3D printed splint design. - M. Laurentjoye, **J. Charton**, P. Desbarats, Michel Montaudon - International Journal of Computer Assisted Radiology and Surgery 9 (Suppl 1): S253–54, Impact Factor 3.42, 2014.

Anthropological Facial Approximation in Three Dimensions (AFA3D): Computer-Assisted Estimation of the Facial Morphology Using Geometric Morphometrics - P. Guyomarc'h, B. Dutailly., **J. Charton**, F. Santos, P. Desbarats, H. Coqueugniot - Journal Forensic Sciences, Impact Factor 2.8, 2014.

Other International Journal (1.5)

The transcriptomic architecture of the human cerebral cortex. - T. Nickl-Jockschat, S. Baek, Z. Peterson, **J. Charton**, M. Pavic, M. Nastruz, E. Rooke, R. Sharkey, S. Eickhoff, M. Hawrylycz, T. Abel - bioRxiv, 24 pages (double lignes) Article long, DOI: 10.1101/2024.06.20.599687, 2024

Autonomous Robotic Ultrasound System for Liver Follow-up Diagnosis: Pilot Phantom Study. - T. Zhang*, S. Kim*, **J. Charton***, H. Ma, K. Kim, N. Li, Q. Li - arXiv, 12 pages, Article long, <https://arxiv.org/abs/2405.05787>, 2024

International Conference Proceedings

APP-RUSS: Automated Path Planning for Robotic Ultrasound System - D. Liu, **J. Charton**, Xiang Li, Quanzheng Li - International Symposium on Biomedical Imaging ISBI, <https://biomedicalimaging.org/2024/> - <https://arxiv.org/abs/2310.14297>, 2024

Multi-task Learning for Hierarchically-Structured Images: Study on Echocardiogram View Classification. - *J. Charton*, H. Ren, S. Kim, C. Maraboto Gonzalez, J. Khambhati, J. Cheng, J. DeFrancesco, A. A. Waheed, S. Marciniak, F. Moura, R. Cardoso, B. B. Lima, M. H. Picard, X. Li, Q. Li - Advances in Simplifying Medical UltraSound - Medical Image Computing and Computer Assisted, Pages 185—194, https://link.springer.com/chapter/10.1007/978-3-031-44521-7_18, 2023

View Classification of Color Doppler Echocardiography via Automatic Alignment Between Doppler and B-Mode Imaging. - *J. Charton**, H. Ren*, J. Khambhati, J. DeFrancesco, J. Cheng, A. A. Waheed, S. Marciniak, F. Moura, R. Cardoso, B. B. Lima, E. Steen, E. Samset, M. H. Picard, X. Li, Q. Li - Advances in Simplifying Medical UltraSound - Medical Image Computing and Computer Assisted, Pages 64—71, https://link.springer.com/chapter/10.1007/978-3-031-16902-1_7, 2022

3D Boolean operations in virtual surgical planning. - *J. Charton*, M. Laurentjoye, Y.J. Kim - International Society for Computer Aided Surgery, June 2017, Barcelona, Spain.

Development of surgical planning software for mandibular reconstruction using fibular flap - L. Kim, Y. Kim, H. Kim, H. Cho, *J. Charton*, D. Lee, J. W. Lee - Computerd Maxillofical Congress, June 2017, Barcelona, Spain.

3D surgical planning and analysis software for orbital fracture reconstruction. - Y.J. Kim, H.A. Kim, H.C. Cho, S.H. Kim, *J. Charton*, D.H. Lee, S.H. Park, W.S. Jeong, J.W. Choi, International Forum on Medical Imaging in Asia, Jan. 2017, Okinawa, Japan.

Boolean operations by a robust, exact, and simple method between two colliding shells. - *J. Charton*, L.H. Kim, Y.J. Kim - Asian Conference on Design and Digital Engineering, 2016, Jeju, Korea.

Mandibular surgery planning and 3D printed splint design. - M. Laurentjoye, *J. Charton*, P. Desbarats, Michel Montaudon - CARS, 2014, Fukuoka, Japan.

Sinefitting: robust curvature estimation on surface triangulation - *J. Charton*, S. Gueorguieva, P. Desbarats. CGVCVIP, 2013, Praha, Czech Republic.

Statistical facial approximation in 3D with TIVMI using geometric morphometrics - P. Guyomarc'h, J. Martin, *J. Charton*, F. Santos, B. Dutailly. 19th mondial meeting of the International Association of Forensic Sciences (IAFS), 2011, Funchal, Madeira, Portugal.

Domestic Conference Proceedings

Virtual Surgical Planning and Surgical Guide Design System for Mandibular Reconstruction Surgery - Hanna Kim, Youngjun Kim, Hyeoncheol Jo, *J. Charton*, Deukhui Lee, Leahyeon Kim, Sehyeon Park, Jeongwoo Lee - Korean CDE association 2017 Winter Conference (한국 CDE학회 2017 동계학술대회) Proceedings, Feb. 2017, Seoul, Korea.

Surgical planning simulation software for mandible reconstruction - Hanna Kim, Youngjun Kim, Hyeoncheol Jo, Shim Eungjun, *J. Charton*, Hyeona Kim, Deukhui Lee, Leahyeon Kim, Sehyeon Park, Jeongwoo Lee - Korean CDE association 2016 Multidisciplinary Conference (한국 CDE학회 2016 부문연합학술대회) Proceedings, Aug. 2016, Seoul, Korea.

Ostéotomie mandibulaire : de la planification virtuelle à la chirurgie. A propos d'un guide chirurgical contrôlant l'occlusion et le condyle mandibulaire. - Mandibular osteotomy: from virtual planning to surgery. About a surgical guide controlling occlusion and mandibular

condyle. - M. Laurentjoye, **J. Charton**, A.S. Ricard, A. Veyret, M.J. Boileau, P. Desbarats, M. Montaudon - 49ème congrès de la Société française de stomatologie, chirurgie maxillo-faciale et chirurgie orale, 2013, Versailles, France.

Conception virtuelle de guides imprimés de positionnement osseux pour la chirurgie des dysmorphoses maxillo-mandibulaires - Virtual design of printed bone positioning guides for maxillomandibular dysmorphism surgery - **J. Charton**, M. Laurentjoye, TIC-Santé, 2012, Bordeaux, France.

Courbures discrètes: outils d'évaluation de formes saillantes sur des maillages - Discrete curvatures: tools for evaluating prominent shapes on meshes - **J. Charton**, S. Gueorguieva, P. Desbarats. AFIG, 2012, Calais, France.

Reviewer of Scientific Journals

- **International Journal of Computer Assisted Radiology and Surgery**, Springer.

- **Journal on Computing and Cultural Heritage**, ACM.

- **Computer-Aided Design Journal**, Elsevier.

Patents

Dispositif de positionnement occlusal et condylien - Occlusal and condylar positioning device - M. Laurentjoye, J. Charton, P. Desbarats, M. Montaudon - BNT219395FR00 - registered January 30th 2015.

Awards

Best Post-doctoral Researcher Award - International Advisory Committee Meeting Center for Bionics, Biomedical Research Institute, KIST - Jury members: William Zev Rymer, M.D./Ph.D. & Russell H. Taylor, Ph.D. - **J. Charton**, Dec. 2016, Seoul, Korea. <http://www.unesco.org/new/en/communication-and-information/flagship-project-activities/memory-of-the-world/about-the-programme/international-advisory-committee-iac/>

MF Planning: software for virtual surgical planning - Y.J. Kim, H.C. Cho, H.N. Kim, E.J. Shim, **J. Charton**, H.A. Kim, D.H. Lee, L.H. Kim, S.H. Park, G.W. Noh, J.W. Lee. - Awarded by Ministry of "Science, ICT (Information Communication Technology) and future planning" of Korea, Sept. 2016, Seoul, Korea.

Research grants

KRF/NRF (Korea Research Fellowship/National Research Foundation of Korea) fund for Excellent Foreign Young Researcher - 2015 – 2019

Region Aquitaine fund for Ph.D student position - 2011 – 2013

Collaborations

Virtual mandibular surgery planning and 3D printed splint design, *CHU Bordeaux (University Hospital Centre - University of Bordeaux)*, *ctBx (Laboratory of cardiothoracic of Bordeaux - University of Bordeaux)*, *LOMA (Laboratory of Medical Anatomy - University of Bordeaux)*, 2011 – 2015

Palais Gallien: the realisation of a 3D printed model of the ancient amphitheatre of Bordeaux, *Ausonius (Archaeology laboratory - University of Bordeaux Montaigne)*, 2011

AFA3D: reconstitution of the face surface of an unknown body from its skull, *PACEA* (Anthropology laboratory - University of Bordeaux), 2010 – 2011

Moz'art: development of software generating an actual mural mosaic from given photography by using a ceramic printer., *Novaltess (company)*, 2010

Terahertz: development of a software modelling and rendering 4-dimensional images generated by terahertz acquisition, *Loma (Physics laboratory - University of Bordeaux)*, 2009

Skin marks evolution: developing of tools for evaluating the efficiency of skin creams by comparing size and colour change along the time, *Cosderma laboratory (private laboratory)*, 2008

Independent projects

SmithDR (Scientific Multi Imaging Tool Handled by a DAG layer) is a platform for designing image processing algorithms. These images can be of any kind, from volumes (e.g. CT scan, MRI, Microscan) to surfaces (e.g. laser scanning and marching cube reconstruction). Developed in C++ under GPL licence. <http://www.lab327.net/projects/SmithDR/>

TEACHING

Introduction to Geometric Modelling	2015-2016
Lecture-6h - Master 2 - Bio-mechanical engineering	University of Science & Technology - Korea
Geometric Modelling	2014-2015
PC*-12h - Master 2 - computer science speciality ISV**	University of Bordeaux - France
Using of Unix Systems	2014-2015
Lecture-30h - Bachelor 3 - computer science and management	University of Bordeaux - France
Numeric Image Initiation	2013-2014
PC-12h - Bachelor 2 - computer science	University of Bordeaux - France
Programming projects	2013-2014
PC-7h30 - Master 1 - computer science	University of Bordeaux - France
Geometric Modelling	2013-2014
PC-12h - Master 2 - computer science speciality ISV	University of Bordeaux - France
Project management	2013-2014
Lecture-30h/PC-24h - Master 2 - computer science speciality software	PUF - International University Hô Chi Minh City - Vietnam
Event programming - C#	2012-2013
Lecture-30h - Bachelor 3 Pro - computer science	PUF - International University Hô Chi Minh City - Vietnam
Using of Unix Systems	2012-2013
Lecture-30h - Bachelor 3 - computer science and management	University of Bordeaux - France
Geometric Modelling	2012-2013
PC-12h - Master 2 - computer science speciality ISV	University of Bordeaux - France
Programming projects	2012-2013
PC-2h - Master 1 - computer science	University of Bordeaux - France

Advanced Database

Lecture-30h - Master 2 - computer science speciality software

2011-2012

PUF - International University
Hô Chi Minh City - Vietnam**Geometric Modelling**

PC-12h - Master 2 - computer science - ISV

2011-2012

University of Bordeaux - France

Programming projects

PC-18h - Master 1 - computer science

2011-2012

University of Bordeaux - France

Master studies final project

PC-6h - Master 2 - computer science

2011-2012

University of Bordeaux - France

Practical Course**Image, Sound, and Video***Summary (*ehpc: equivalent to one hour of practical course, 1 hour of lecture equals 1.5 ehpc*)**

Years/Cat.	2011-12	2012-13	2013-14	2014-15	2015-16	Lecture	PC	Total
Hours	66ehpc	74ehpc	85ehpc	96ehpc	9ehpc	124h/186ehpc	142ehpc	328ehpcx

ADMINISTRATION

Elected member of the laboratory council of the LaBRI

2012-2015

*Representative of non-permanent members.***President of AFoDIB**

2012-2013

AFoDIB, the Association for Doctoral Training in Computer Science of Bordeaux exists since September 20, 1994. It is governed by the law of July 1, 2021, and the decree of August 16, 2021. It was created to gather, represent and guide doctoral students in the process of the thesis.

ACTIVITIES

Hobbies Motorbike, Karate, Scuba diving