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WORK EXPERIENCE

University of Geneva, EPFL & HUG

Senior Research associate

Prof Idris Guessous & Dr Stéphane Joost

Geneva, Switzerland — November 2022 - ...

- Leading a comprehensive evaluation of integrative medicine's usage and cost-effectiveness using Swiss health insurance big (spatial) data, causal inference and machine learning.

University of Geneva, EPFL & HUG

Postdoctoral researcher

Prof Idris Guessous & Dr Stéphane Joost

Geneva, Switzerland — July 2021 - October 2022

- Conducted analyses of COVID-19 testing and sequencing data to gain insights into the differences in epidemic profiles and determinants of diffusion dynamics.
- Highlighted the evolution of COVID-19's spatiotemporal diffusion dynamics, emphasizing the significant role of air pollution even at high spatial resolutions.
- Successfully secured funding for a large project aimed at evaluating the cost-effectiveness of integrative medicine.
- Spearheaded a consulting project analyzing citizen subsidies in the canton of Vaud, including identifying recipients, assessing regional disparities in utilization, and creating scenarios to optimize social service center locations.
- Led a mandated project for the breast cancer screening program in the canton of Geneva, identifying regional disparities in screening participation and providing insights into the determinants of participation, resulting in recommendations for program improvement.

University of Geneva, EPFL & HUG

PhD student in Life Sciences - Digital Health & Genomics

Prof Idris Guessous & Dr Stéphane Joost

Geneva, Switzerland — Apr 2018 - June 2021

- Thesis title : “*Geospatial approaches for precision public health*”
- Authored and published three articles based on geospatial analyses of health risk factors and their determinants allowing for targeted and informed public health interventions.
- Published two articles during the COVID-19 pandemic demonstrating the potential of geospatial approaches in enhancing epidemiological surveillance by accurately identifying high incidence areas and assessing the risk of syndemic in economically disadvantaged regions.
- Collaborated with a multidisciplinary team of public health experts, software engineers, and designers to develop @choum, a digital health app for symptom reporting and early outbreak detection through geospatial analyses.
- Consulted for the Canton of Geneva's Health Department (DGS) during the COVID-19 vaccination campaign, successfully identifying high-risk groups to enhance the DGS's vaccination strategy optimization.
- Conducted a comprehensive territorial health diagnosis for the commune of Plan-les-Ouates (Geneva, CH) to evaluate the socio-sanitary landscape and inform future planning aligned with demographic trends.

HUG - Réseau Delta (20%)

Spatial data scientist

Prof Idris Guessous & Dr Philippe Schaller

Geneva, Switzerland — Feb 2019 - ...

- Built an online digital platform that integrated real-time data analytics, statistical analyses, and data visualizations using Python, Streamlit and Heroku.
- Developed a pilot of innovative data feedback solutions to improve the quality and efficiency of health-care practices for over 250,000 patients and 1,000 physicians.

- Led the integration of GIS and spatial analyses into the information process and decision making of the Réseau Delta.

HUG - Municipality of Plan-les-Ouates

Research scientist

Prof Idris Guessous & Dr Stéphane Joost

Geneva, Switzerland — Apr 2018 - Jan 2019

- Led the analyses, writing and presentation of a mandated project for the municipality of Plan-les-Ouates to assess the current and future healthcare needs of the local population.
- Conducted comprehensive demographic, socioeconomic, and environmental assessments of the municipality using multiple statistical and spatial analyses to inform evidence-based recommendations for the design and construction of a new healthcare center.
- Collaborated with stakeholders to prioritize key healthcare practices and services to be included in the new healthcare center, resulting in a patient-centered facility that meets the needs of the community.

Harvard Medical School — Dana Farber Cancer Institute

Bioinformatics technician

Prof Marc Vidal

Boston (MA), USA — Mar 2016 - Nov 2017

- Programmed and implemented various quality controls for the human interactome project "HuRI" (published in Nature in 2020).
- Conducted diverse data analyses including protein network analyses, community detection, DNA sequencing, ... and data management using Python, R and SQL.

Harvard Medical School — Dana Farber Cancer Institute

Master Thesis

Prof Marc Vidal

Boston (MA), USA — Feb 2015 - Sep 2015

- "Study of interactome network perturbations underlying human disease". Master Thesis conducted in Prof Marc Vidal's lab at Harvard Medical School.

Pasteur Institute — Free University Brussels (ULB)

Bachelor thesis

Prof. Michel J. Penninckx

Brussels, Belgium — Oct 2012 - June 2013

- "The potential of *Cerrena unicolor* laccase immobilized on mesoporous silica beads for removal of organic micropollutants in wastewaters." Bachelor thesis conducted at the Pasteur Institute (Brussels) and the Faculty of Chemical Engineering

EDUCATION

PhD in Life Sciences - Genomics and Digital Health

2018-2021

Prof Guessous and Dr Joost, University of Geneva, Switzerland

MSc in Bioengineering

2013-2015

Gembloux Agro Bio Tech, University of Liège, Belgium

Erasmus Student Exchange - MSc in Bioengineering

2014-2014

Universtat Politecnica de Valencia, Spain

BSc in Bioengineering

2010-2013

Free University of Brussels, Belgium

CERTIFICATES

SSPH+ Certificate in Public Health

2018-2021

Swiss School of Public Health, Switzerland

Causal Diagrams: Draw Your Assumptions Before Your Conclusions

2020

Harvard (edX)

Innovation, Entrepreneurship and Business Transformation

2016

Harvard Extension School, Cambridge (MA), USA

Computer Science and Programming Using Python

2016

Massachusetts Institute of Technology (edX)

Psychology of Negotiation

2015

TECHNICAL SKILLS

Python and R	Data processing, GIS, modelling, (spatial) clustering, classification...
Web App development	Streamlit, Dash, Heroku
Other softwares	QGIS, GeoDa, Cytoscape, Office Suite, Adobe Lightroom
Languages	French (C2), English (C2), Spanish (B1), Dutch (B1)

GRANTS

SantéIntégra	2022
<i>Investigator on a project funded by the Leenaards Foundation to explore the impact of integrative medicine usage on health outcomes and healthcare costs.</i>	
	130,000 CHF
@choum	2021
<i>Investigator on a project funded by the Private Foundation of the Geneva University Hospitals, UBS and UBP to develop a digital health tool for symptom reporting and early outbreak detection through geospatial analyses</i>	
	250,000 CHF

FELLOWSHIPS

Erasmus+ Mobility	2015
<i>Fellowship to conduct a master thesis at Harvard Medical School</i>	
	3,600 EUR
Erasmus+ Mobility	2014
<i>Fellowship to study at the Universitat Politècnica de València</i>	
	2,400 EUR

TEACHING

Exploratory Data Analysis and Geovisualization	2019
<i>Co-instructor (Main instructor: Dr Stéphane Joost (EPFL))</i>	
	EPFL, Lausanne, Switzerland
Spatial socioeconomic vulnerability index	June, 2019
<i>Invited Lecturer - Master of Advanced Studies in Urbanism</i>	
	Geneva, Switzerland
Geospatial Approaches for Precision Public Health	September, 2021
<i>Invited Lecturer - Master of Advanced Studies in Public Health</i>	
	Geneva, Switzerland

SELECTED MEDIA COVERAGE

RTS	January, 2021
<i>Une application pour identifier les foyers de Covid-19 près de chez soi</i>	
RTS	January, 2021
<i>Un virus dans la ville</i>	
ZEIT	January, 2021
<i>Das Leiden der anderen</i>	
RTS	January, 2021
<i>L'application Atchoum permet une détection précoce du coronavirus.</i>	
RTS	October, 2020
<i>Dis-moi où tu vis et je te dirai comment tu vas</i>	

VOLUNTEERING

EPFL Cooperation and Development Center

GIS scientist

2018-2019

Geneva, Switzerland

- Optimized location allocation for an innovative personal protective equipment (PPE) with healthcare accessibility analyses using Accessmod and PySAL (Python).

Geneva language exchange

Volunteer

2018

Geneva, Switzerland

- Instructed during weekly French language events for newly arrived expats and migrants in Geneva.

INTERESTS

Photography, biking, running, swimming, rock climbing, tennis, windsurf

SCIENTIFIC PUBLICATIONS

Co-author *Detection of SARS-CoV-2 infection clusters: The useful combination of spatiotemporal clustering and genomic analyses.*

Frontiers in Public Health **2022**. doi.org/10.3389/fpubh.2022.1016169

Co-author *The neighborhood environment and its association with the spatio-temporal footprint of tobacco consumption and changes in smoking-related behaviors in a Swiss urban area.*

Health & Place **2022**. doi.org/10.1016/j.healthplace.2022.102845

Co-author *Perception of the Communication Campaign for @choum a Symptom Reporting App: Insights from Semi Structured Interviews.*

Studies in Health Technology and Informatics **2022**. doi:10.3233/SHTI220568

Co-author *Risk of Reinfection After Seroconversion to Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2): A Population-based Propensity-score Matched Cohort Study.*

Clinical Infectious Diseases **2022**. doi.org/10.1093/cid/ciab495

Co-author *Seroprevalence of anti-SARS-CoV-2 IgG antibodies, risk factors for infection and associated symptoms in Geneva, Switzerland: a population-based study.*

Scandinavian journal of public health **2022**. doi.org/10.1177/14034948211048050

First author *Evolution of the spatial distribution of alcohol consumption following alcohol control policies: a 25-year cross-sectional study in a Swiss urban population.*

medRxiv (Preprint) **2022**. doi.org/10.1101/2022.01.16.22269160

Co-author *Geographic footprints of life expectancy inequalities in the state of Geneva, Switzerland.*

Scientific reports **2021**. doi.org/10.1038/s41598-021-02733-x

First author *Geospatial Analysis of Sodium and Potassium Intake: A Swiss Population-Based Study.*

Nutrients **2021**. doi.org/10.3390/nu13061798

Co-first author *Detection of Spatiotemporal Clusters of COVID-19-Associated Symptoms and Prevention using a Participatory Surveillance App: The @choum Study Protocol.*

JMIR Research Protocols **2021**. doi.org/10.2196/30444

Co-author *Can big data be used to monitor the mental health consequences of COVID-19?*.
International Journal of Public Health **2021**. doi.org/10.3389/ijph.2021.633451.

Co-author *Binary Interactome Models of Inner-Versus Outer-Complexome Organization*.
bioRxiv **2021**. doi.org/10.1101/2021.03.16.435663.

Co-author *Serology-informed estimates of SARS-CoV-2 infection fatality risk in Geneva, Switzerland*.
The Lancet Infectious Diseases **2021**. doi.org/10.1016/S1473-3099(20)30584-3.

Co-author *Heterogeneous contributions of change in population distribution of body mass index to change in obesity and underweight*.
Elife **2021**. doi.org/10.7554/eLife.60060.

First author *Socioeconomically Disadvantaged Neighborhoods Face Increased Persistence of SARS-CoV-2 Clusters*.
Frontiers in Public Health **2021**. doi.org/10.3389/fpubh.2020.626090.

Co-author *Perceptions of immunity and vaccination certificates among the general population: a nested study within a serosurvey of anti-SARS-CoV-2 antibodies (SEROCoV-POP)*.
Swiss Medical Weekly **2020**. doi.org/10.4414/smw.2020.20398.

Co-author *Height and body-mass index trajectories of school-aged children and adolescents from 1985 to 2019 in 200 countries and territories: a pooled analysis of 2181 population-based studies with 65 million participants*.
The Lancet **2020**. doi.org/10.1016/S0140-6736(20)31859-6.

First author *Geospatial digital monitoring of COVID-19 cases at high spatiotemporal resolution*.
The Lancet Digital Health **2020**. doi.org/10.1016/S2589-7500(20)30139-4.

Co-author *Seroprevalence of anti-SARS-CoV-2 IgG antibodies in Geneva, Switzerland (SEROCoV-POP): a population-based study*.
The Lancet **2020**. doi.org/10.1016/S0140-6736(20)31304-0.

Co-author *A reference map of the human binary protein interactome*.
Nature **2020**. doi.org/10.1038/s41586-020-2188-x.

Co-author *GeoLaus, une étude de l'influence des caractéristiques géo-environnementales sur la santé*.
Praxis **2020**. doi.org/10.1024/1661-8157/a003363.

Co-author *Seroprevalence of anti-SARS-CoV-2 IgG antibodies, risk factors for infection and associated symptoms in Geneva, Switzerland: a population-based study*.
medRxiv **2020**. doi.org/10.1101/2020.12.16.20248180.

Co-author *Household Transmission of SARS-COV-2: Insights from a Population-based Serological Survey*.
medRxiv **2020**. doi.org/10.1101/2020.11.04.20225573.

Co-author *Repositioning of the global epicentre of non-optimal cholesterol.*
Nature **2020**. doi.org/10.1038/s41586-020-2338-1.

Co-first author *Overlapping spatial clusters of sugar-sweetened beverage intake and body mass index in Geneva state, Switzerland.* Nutrition and Diabetes **2019**. doi.org/10.1038/s41387-019-0102-0.

Co-author *Mapping, modeling, and characterization of protein-protein interactions on a proteomic scale.* Nutrition and Diabetes **2017**. doi.org/10.1016/j.sbi.2017.05.003.