Python Programming

Course Intro.

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Department of Geography
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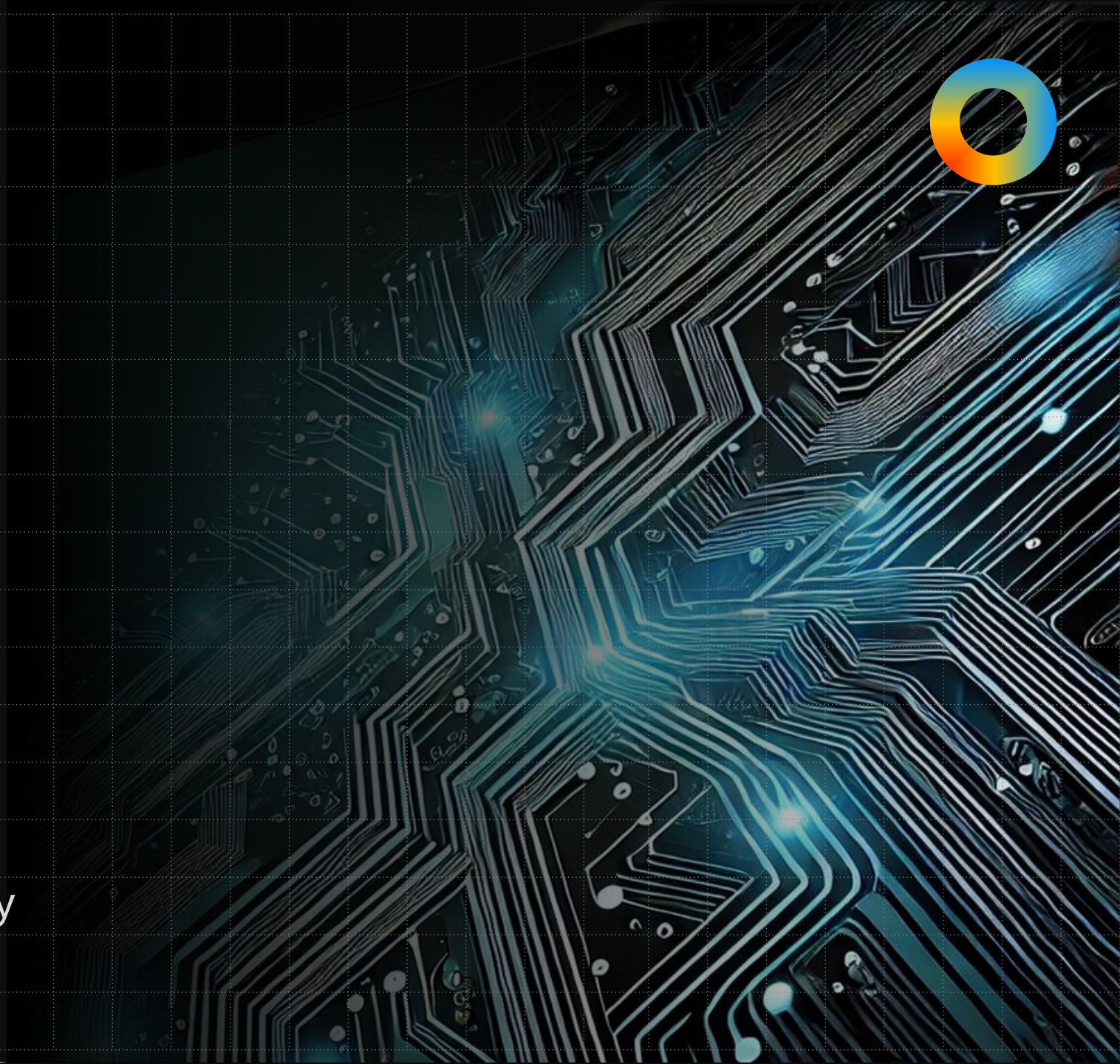

Outlines

- About CCH
- Course Intro
- Grading Policy
- Why do you need to take this course?
- What will you learn from this course?
- Question Time

About CCH

現職:
國立臺灣師範大學地理系 助理教授

主要經歷:
中原大學智慧運算與大數據學士班/碩士學位學程 助理教授
台灣資安鑄造股份有限公司 人工智慧分析顧問
臺北醫學大學醫學系放射線學科 博士後研究員
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資訊工業策進會資安科技研究所 工程師
國家災害防救科技中心坡地組 實習生
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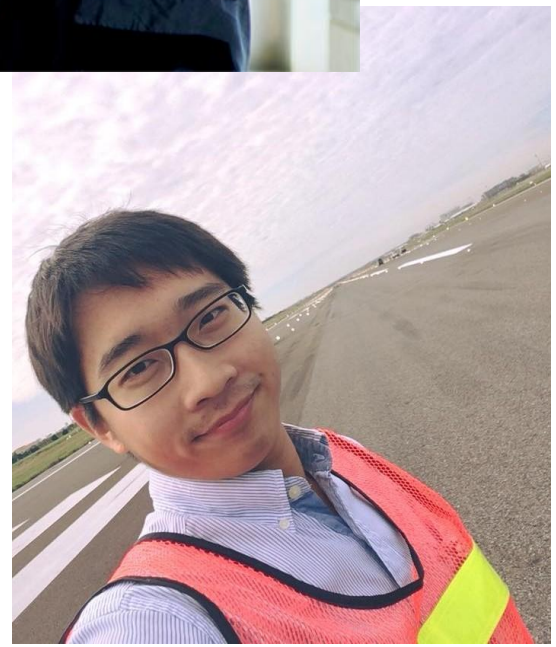
學歷:
國立臺灣大學地理環境資源學系 博士
國立臺灣大學地理環境資源學系 碩士
實踐大學食品營養與保健生技學系 碩士
國立臺北教育大學社會與區域發展學系 學士



Research Interests

Course Intro.

- In the capacity of an urban Geographic Information Systems (GIS) researcher, one is confronted with the formidable challenge of dealing with vast and diverse datasets, some of which may be dynamically generated in real-time (streaming data) rather than being static in nature.
- Consequently, the initial inquiry that naturally arises pertains to the methods and tools available for the processing of "Big Data" or "Streaming Data" within the computational environment.

Course Intro.

Python, being one of the most ubiquitous programming languages, offers an array of pragmatic packages and libraries.

These package resources, meticulously designed and curated, not only expedite the execution of data analytics but also furnish an assortment of sophisticated visualization tools capable of captivating the attention of stakeholders and researchers alike.

Course Intro.

Week	Date	Content
1	Feb. 23	Course Introduction
2	Mar. 02	Python Environment Settings
3	Mar. 09	Variable & Operation
4	Mar. 16	Comment & Markdown
5	Mar. 23	Collection
6	Mar. 30	Flow Control + Function
7	Apr. 06	Numpy + Pandas (I)
8	Apr. 13	Pandas (II) + Visualization
9	**Apr. 20**	**Midterm Pitch**
10	Apr. 27	Statistics

Week	Date	Content
11	May 04	Regression Analysis
12	May 11	ED & SVD + PCA
13	May 18	GeoPandas
14	May 25	GeoVisualization
15	**Jun. 01**	**Final Report Presentation I**
16	**Jun. 08**	**Final Report Presentation II**

Grading Policy

All you have to do is study hard and feel free to ask question when you do not understand.

I believe that if you fulfill all required items, and then you will pass this course / get a high GPA.

Do mot worry about the grade! The most important things is what you learn from this course.

Attendence	10%	Midterm Report	30%
Assignment	30%	Final Report	30%

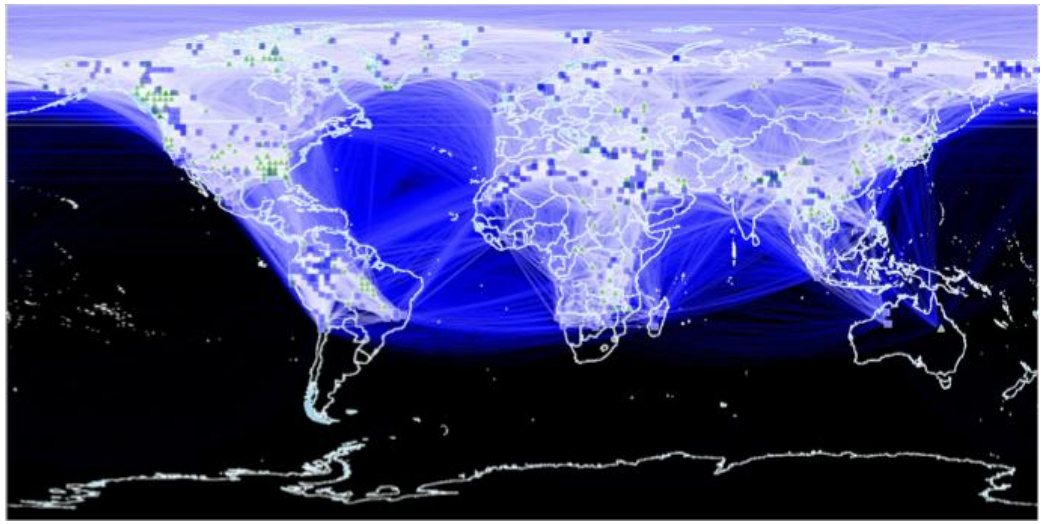
Why do you need to take this course?

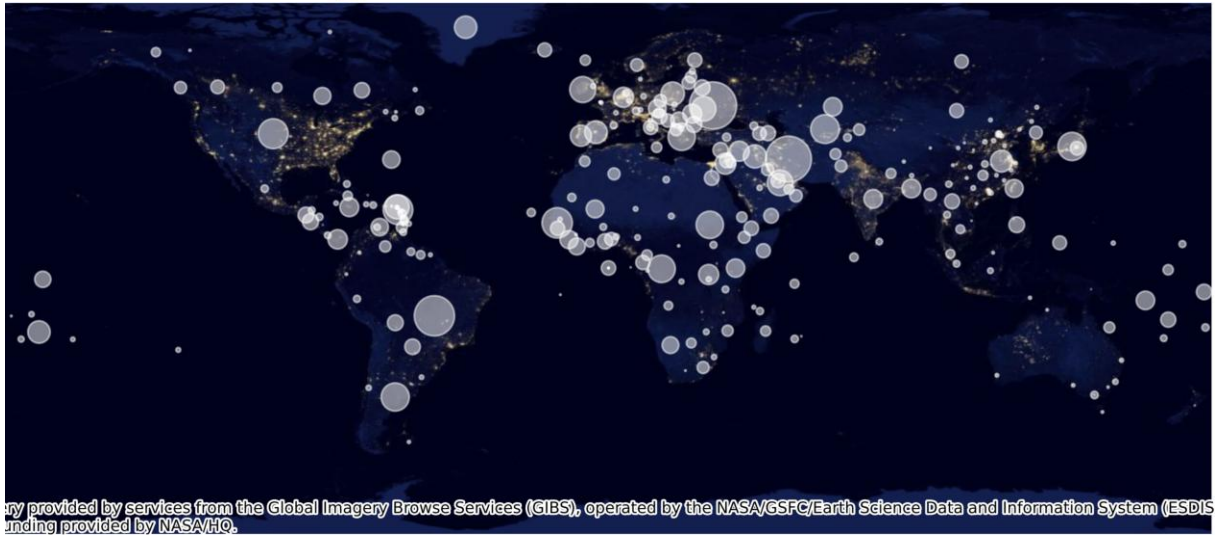
As AIoT and 5G development, more and more data streaming sources have been established, but how to analyze these data efficiently and proffer insightful information for stakeholders.

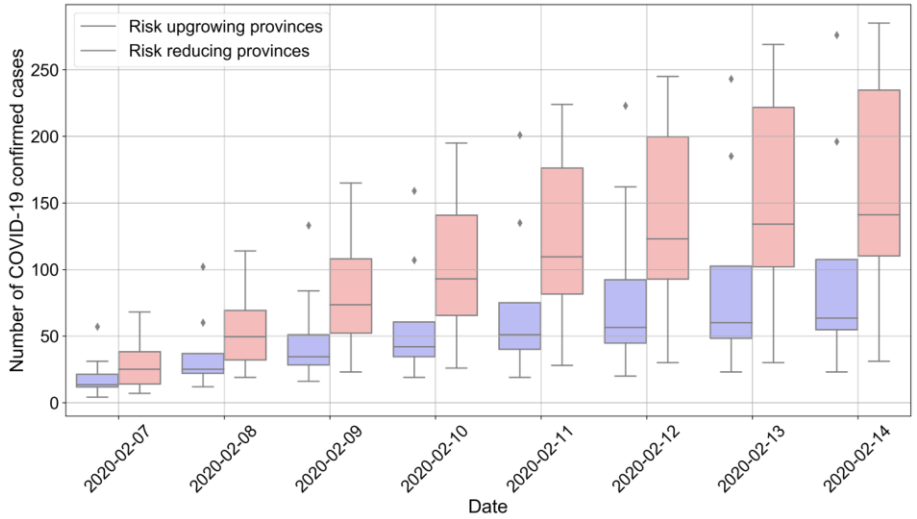
What will you learn from this course?

- At the beginning of this course, we will teach Python programming with several examples, which could accelerate your learning curve of data preprocessing and data analysis.
- The second part of this course is to introduce some useful and common machine learning algorithms with a little bit of mathematics (easy part) and programming (using packages).
- The third part is image processing, which is also a common data source in the geography field.

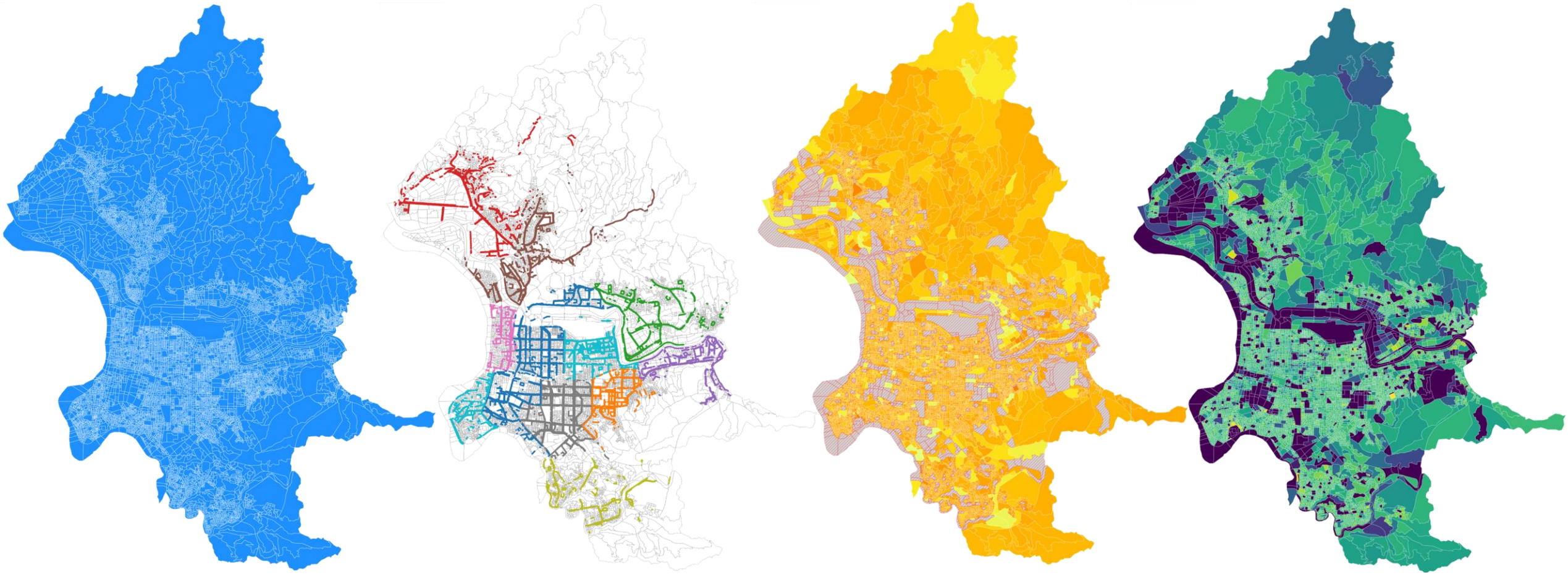
Some Examples







Some Examples



The Geographical Journal (SSCI)

IF 3.6 Q1 16/172 in Geography

Received: 21 March 2024 | Revised: 7 September 2024 | Accepted: 12 September 2024

DOI: 10.1111/geoj.12609

ARTICLE

Spatiotemporal topology of religious spread in a multi-religious metropolis: A historical religious profile of Taipei City in Taiwan from 1660 to 2020

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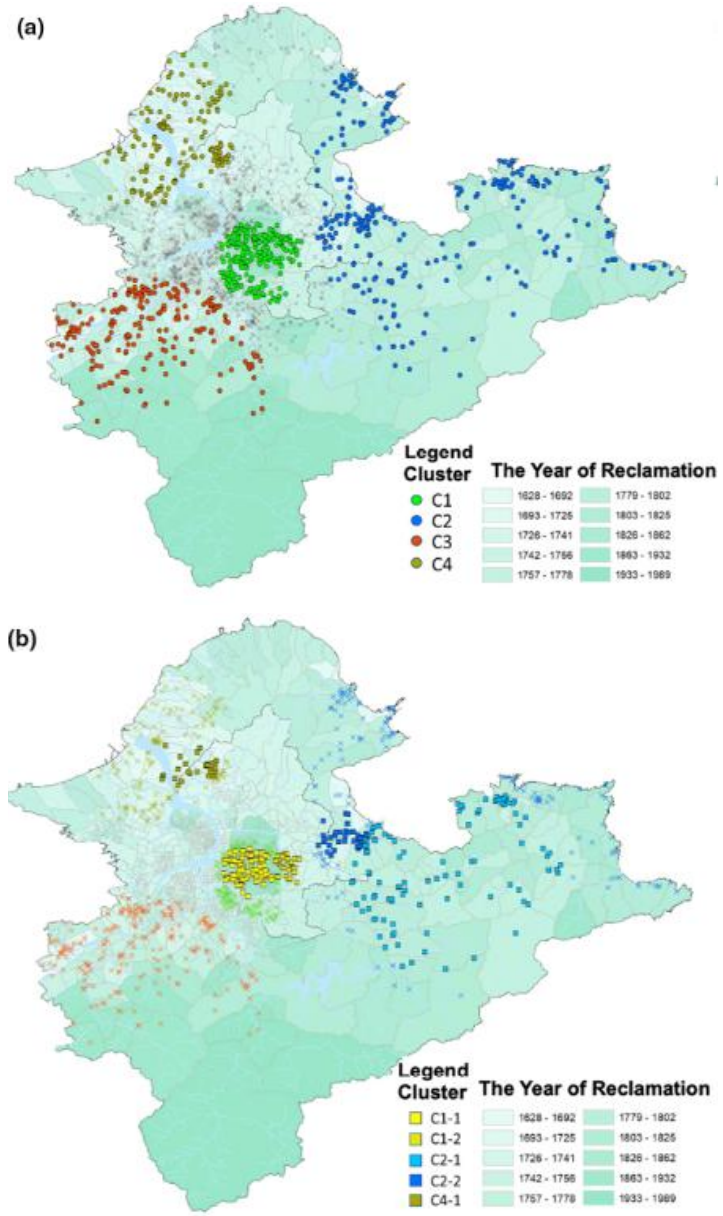
Abstract

Religious identities play an important role in shaping migrants' experiences. Understanding the spatiotemporal distribution of religions enhances our knowledge of both religious expansion and religious cultures. This paper aims to leverage spatiotemporal analysis to characterise the topology of the spread of multiple religions in the Taipei metropolitan area from 1660 to 2020, including Folk Taoism (853 temples/altars, 55.39%), Christianity (306 churches, 19.87%) and Buddhism



IEEE Transactions on Computational Social Systems (SCIE)

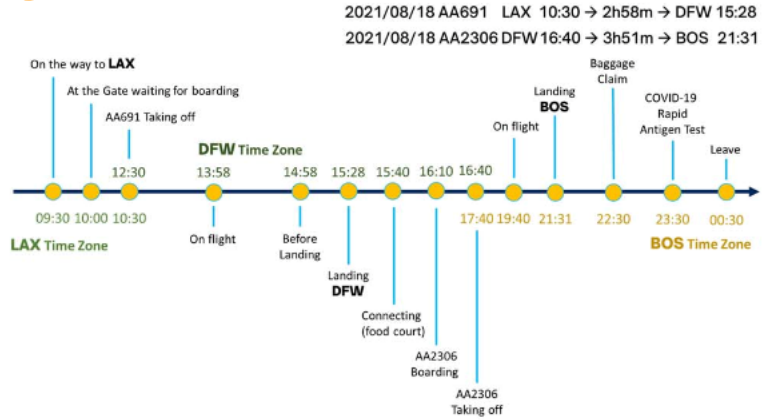
IF 4.5 Q1 6/32 in Computer Science, Cybernetics

Timely Personalized Exposure Risk Estimation for Air Travelers

Chun-Hsiang Chan, *Member, IEEE*, and Tzai-Hung Wen

***Abstract*—Air travel is one of the main ways in which contagious diseases spread across regions. State-of-the-art platforms and apps cannot timely and customized estimate exposure risk for air passengers. This study integrated time-varying flight schedules, connecting airports, and epidemic situations in airport catchment areas for estimating a traveler's exposure risk during the user-defined flight journey and applying to the timely exposure risk during air travel (TERAT) for a spatial decision support system (SDSS). We leveraged epidemic information and dynamic flight schedules to estimate personalized and timely exposure risk. Flight frequency and arrival time of all inbound flights within 6 h before and after the current time were encompassed to determine the potentially infected passenger sources. We estimated the timely airport exposure risk for the user's destination airport and its top 10 importation risk origin airports and demonstrated the top 10 risk final destination airports from the user's destination airport. Two real-world scenarios showed that direct flight and transfer air passengers were exposed to time-varying risks at different travel**

short time [1], [2], [3], [4], [5]. Infected air passengers may spread the virus to other air passengers during air travel through talking or contact at various points, such as at the origin airport (e.g., waiting for boarding or duty-free shopping), on the flight (e.g., toilet, touched items or short-distance talking), and at the destination airport (e.g., luggage cart, waiting for customs, or waiting for luggage) [6]. Assessing the exposure risk of air travel during a pandemic or infectious disease outbreak is vital for air passengers to reduce exposure risks during the journey [7]. Regarding exposure risks during air travel, infected outbound and inbound air passengers are the major sources at the origin and destination airports, respectively, because inbound and outbound air passengers usually use different pathways. The detailed roles of the three major sources in the exposure risk during air travel are depicted below.



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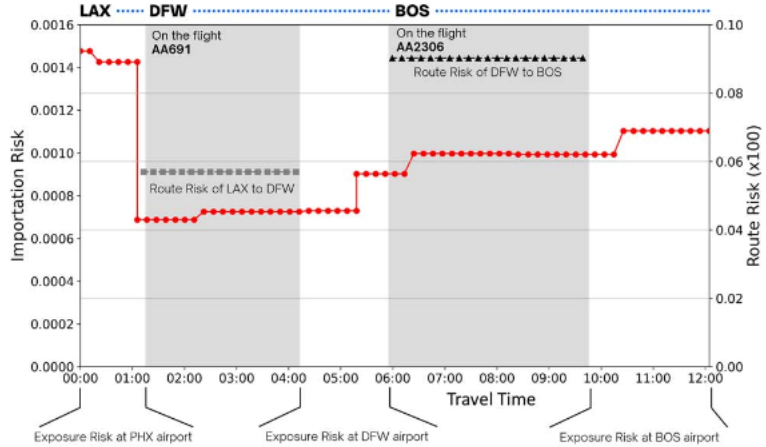
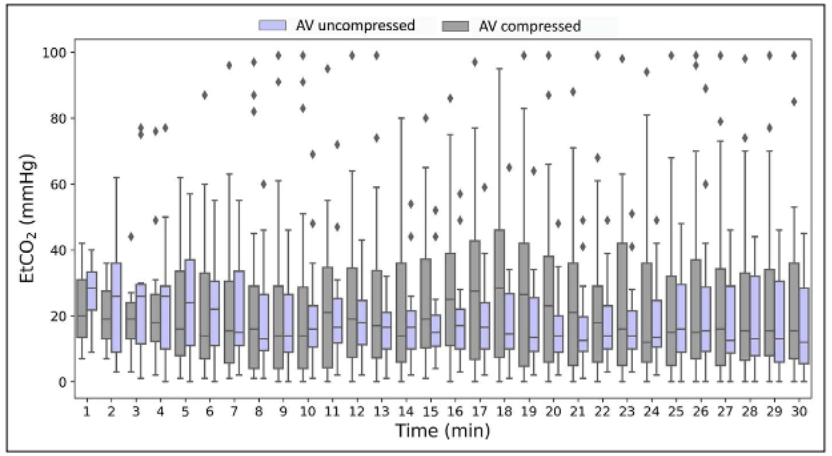


Critical Care Medicine (SCIE)

IF 7.7 Q1 6/55 in Critical Care Medicine



CLINICAL INVESTIGATION

Cardiopulmonary Resuscitation Without Aortic Valve Compression Increases the Chances of Return of Spontaneous Circulation in Out-of-Hospital Cardiac Arrest: A Prospective Observational Cohort Study

OBJECTIVES: Following current cardiopulmonary resuscitation (CPR) guidelines, which recommend chest compressions at "the center of the chest," ~50% of patients experiencing out-of-hospital cardiac arrest (OHCA) undergo aortic valve (AV) compression, obstructing blood flow. We used resuscitative transesophageal echocardiography (TEE) to elucidate the impact of uncompressed vs. compressed AV on outcomes of adult patients experiencing OHCA.

DESIGN: Prospective observational cohort study.

SETTING: Single center.

PATIENTS: This study included adult OHCA patients undergoing resuscitative TEE in the emergency department. Patients were categorized into AV uncompressed or AV compressed groups based on TEE findings.

INTERVENTIONS: None.

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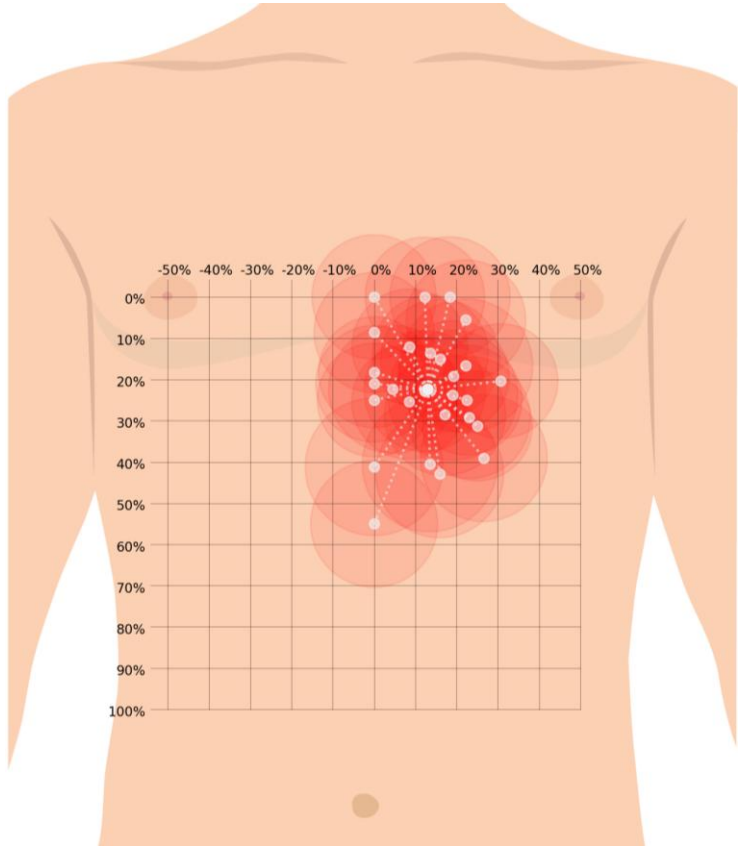

The End

Thank you for your attention!

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