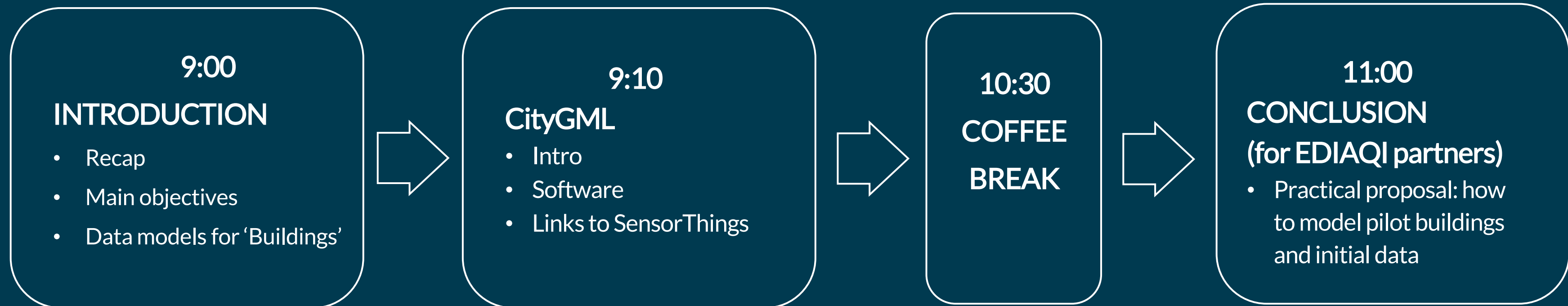


EDIAQI

Evidence
Driven Indoor
Air Quality
Improvement

Fourth session (October 27th)



Giorgio Agugiaro
TU Delft

Giorgio Agugiaro

Assistant Professor

Short Bio

- Since 2018/08: **Assistant professor (Tenure track)** @ Delft University of Technology, 3D Geoinformation group
- 2020/02 - 2020/03: **Visiting researcher** @ [Ordnance Survey](#), Southampton, UK (VOLTA project)
- 2014/03 - 2018/07: **Researcher** @ [Austrian Institute of Technology](#) (AIT), [Digital Resilient Cities and Regions](#) research unit, Vienna, Austria
- 2010/05 - 2014/02: **Researcher** @ [Fondazione Bruno Kessler](#) (FBK), [3D Optical metrology](#) research unit (3DOM), Trento, Italy
- 2013/03 - 2013/09: **Visiting researcher** @ [Technische Universität München](#) (TUM), [Chair of Geoinformatics](#), Munich, Germany
- 2004/12 - 2010/03: **Research and teaching assistant** @ [Università di Padova](#), [Laboratory of Surveying and Geomatics](#) (LRG), Padova, Italy
- 2006/01 - 2009/07: **PhD Student** @ [University of Padova](#) and [Technische Universität Berlin](#) (TUB), [Institute of](#)



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Department of Urbanism
Faculty of Architecture and the Built Environment

Introduction

Piergiorgio Cipriano



This project has received funding from the European Union's HE research and innovation programme under the grant agreement No. 101057497

EDIAQI

First session (June 21st)

INTRODUCTION

- Presentations
- OGC Intro
- Data interoperability



SENSORTHINGS API

- Intro
- Data Model
- API



STA REQUESTS

- Locations, Things
- Datastream, Multidatastream
- Observations

FROST

- Characteristics
- Deploy options
- PostgreSQL and plugin



STA+

- STA limitations
- STA+ additional properties
- Applications for EDIAQI



INSPIRE

- Directive
- Regulations
- Technical Guidelines

Second session (July 21st)

WHY FROST?

- Reasons
- Evolution
- Live demos

Dr. Hylke van der Schaaf
(Fraunhofer Institute)

ROUND TABLE

- Questions and comments to Dr. van der Schaaf

DEPLOY ON TOMCAT

- Example Ferrara
 - PostgreSQL
 - PostGIS
 - TimeScaleDb

DEPLOY DOCKER

- Brief how-to

DATA INGESTION

- Examples in Ferrara
 - weather
 - traffic
 - air quality (out)

SEMANTICS 4 EDIAQI

- Parameters and UoM
- Frequency
- Location / Spatial

Third session (September 29th)

INTRODUCTION

- Recap
- Data visualization
- Web examples on AQ

JAVASCRIPT WEB

- Intro
- JS libraries for SensorThings endpoints

IAQ DATA VIZ

- Data storytelling
- Inputs from audience (Q)

IAQ DATA VIZ

- Inputs from audience (A)

PYTHON DESKTOP

- QGIS recap
- Plugin for SensorThings
- Evolution

CONCLUSIONS

- Recap of today webinar
- Next webinar (October 27th)



Training Session on data interoperability: data visualization from SensorThings API

On Friday 29th of September 2023, the third training session on data interoperability for sensors was held by the Deda Next team, titled "Examples of data visualization of dynamic data from SensorThings API (web and desktop)".



Training Session on data interoperability: FROST open source server solution for interoperable dynamic data

On Friday 21st of July 2023, the second training session on data interoperability for sensors was held by the Deda Next team, titled "SensorThings API standard and FROST open source server solution for interoperable dynamic data".



Training Session on data interoperability: SensorThings API standard and FROST open source server solution

On Wednesday 21st of June 2023, the first training session on data interoperability for sensors was held by the Deda Next team, titled "SensorThings API standard and FROST open source server solution".



Nahhhh...I don't think It will work. Let's do something different...something smarter...something cooler!



INSPIRE Directive (... is law)



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English (en) ▼

INSPIRE KNOWLEDGE BASE

Infrastructure for spatial information in Europe

[European Commission](#) > [INSPIRE](#) > [Implement](#) > [Data Specifications](#)

[Home](#) [Learn](#) ▼ [Implement](#) ▼ [Participate](#) ▼ [Use](#) ▼ [Toolkit](#)

Implement

- Guide for implementers
- 📖 Good Practice Library
- Data Specifications
- Monitoring & Reporting
- Metadata
- Network Services
- Data and Service Sharing
- Spatial Data Services
- INSPIRE Coordination Maintenance and Implementation

Data Specifications

The [INSPIRE Implementing Rules on interoperability of spatial data sets and services](#) (IRs) and [Technical Guidelines](#) (Data Specifications) specify common data models, code lists, map layers and additional metadata on the interoperability to be used when exchanging spatial datasets.



Datasets in scope of INSPIRE are ones which come under one or more of the 34 spatial data themes (below) set out in the [INSPIRE Directive](#).

Interoperability in INSPIRE means the possibility to combine spatial data and services from different sources across the European Community in a consistent way without involving specific efforts of humans or machines. Interoperability may be achieved by either changing (harmonising) and storing existing data sets or transforming them via services

<https://inspire.ec.europa.eu/data-specifications/2892>

INSPIRE Technical Guidelines "Buildings"



INSPIRE
Infrastructure for Spatial Information in Europe

D2.8.III.2 Data Specification on **Buildings** – Technical Guidelines

Title	D2.8.III.2 INSPIRE Data Specification on <i>Buildings</i> – Technical Guidelines
Creator	INSPIRE Thematic Working Group <i>Buildings</i>
Date	2013-12-10
Subject	INSPIRE Data Specification for the spatial data theme <i>Buildings</i>
Publisher	European Commission Joint Research Centre
Type	Text

INSPIRE Technical Guidelines "Buildings"

<https://inspire-regadmin.jrc.ec.europa.eu/dataspecification/ThemeOverview.action?themeld1=bu>

European Commission > INSPIRE > INSPIRE Interactive Data Specifications > Read/Compare Related Themes > Detailed description

Home

Read/Compare Technical Guidelines

Find your scope

Favorites



Select Theme...



Buildings

Theme Overview

Executive Summary

Detailed description

Data content and structure

Data quality

Metadata

Delivery

Data capture

Portrayal

Abstract Test Suite

Use cases



Microsoft Word - INSPIRE_DataSpec...

6 / 15



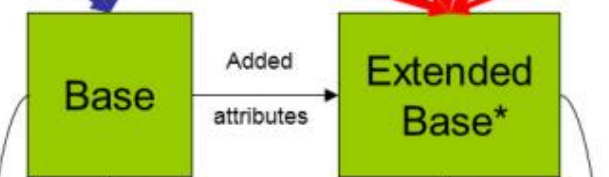
90%



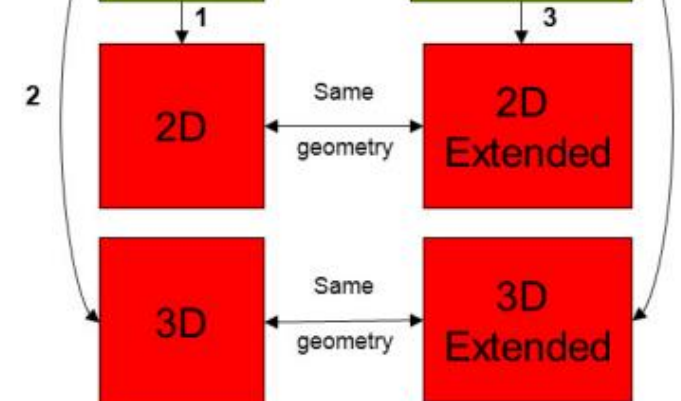
Main feature types



Semantics



Geometry



Alternative deliveries:

INSPIRE Technical Guidelines “Buildings”

Use cases

Building data is a key theme for environmental studies. On one hand, buildings are the places where people live, work and spend more of their time and where they should be ensured good quality of habitat and protection from risks (flood, fire, earthquake, ...) and from pollutions (noise, **air pollution**, ...). Buildings by themselves may deserve protection because of their historical or architectural interest. On the other hand, buildings and their inhabitants are consuming natural resources (heating, land, transport, construction material) and there is clear need to promote more sustainable buildings and to control urban spreading. This data specification addresses requirements related to European reporting, such as the Noise Directive, the **Air Quality Directive**, the Energy Performance of Building Directive and the Population and Housing Census Directive. The Flood Directive and the project of Soil Directive have also been taken into account.

<https://inspire-regadmin.jrc.ec.europa.eu/dataspecification/ExecutiveSummary.action?hideMenu=&themeld1=bu>

INSPIRE Technical Guidelines “Buildings”

Existing data and standards

There are nowadays many datasets describing building related features. These datasets are mainly produced by well identified member state organisations, usually mandated national cadastral and mapping agencies. Building data exist with various levels of detail both in geometry and in semantics. For example, there are representations of buildings and constructions as points, surfaces or solids. The 2D surface representation is the most frequent, the building having been captured e.g. by its foot print or roof edge or envelope. The 3D representations of buildings are generally described using the well defined levels of detail of the CityGML OGC standard. All these various representations have their interest and their limits.

<https://inspire-regadmin.jrc.ec.europa.eu/dataspecification/ExecutiveSummary.action?hideMenu=&themeld1=bu>



Open Geospatial Consortium

Key topics ↓ About ↓ Innovation

Member login

Contact



Home / Standards / CityGML

CityGML

Overview

The CityGML standard defines a conceptual model and the representation, storage and exchange of virtual 3D the integration of urban geodata for a variety of applications and Urban Digital Twins, including urban and landscape Information Modeling (BIM); mobile telecommunication; 3D cadastre; tourism; vehicle & pedestrian navigation; driving assistance; facility management, and; energy, 1 simulations.



	LOD x.0	LOD x.1	LOD x.2	LOD x.3
LOD0	 LOD0.0	 LOD0.1	 LOD0.2	 LOD0.3
LOD1	 LOD1.0	 LOD1.1	 LOD1.2	 LOD1.3
LOD2	 LOD2.0	 LOD2.1	 LOD2.2	 LOD2.3
LOD3	 LOD3.0	 LOD3.1	 LOD3.2	 LOD3.3

<https://3d.bk.tudelft.nl/lod/>

<https://ogc.org/standards/citygml>



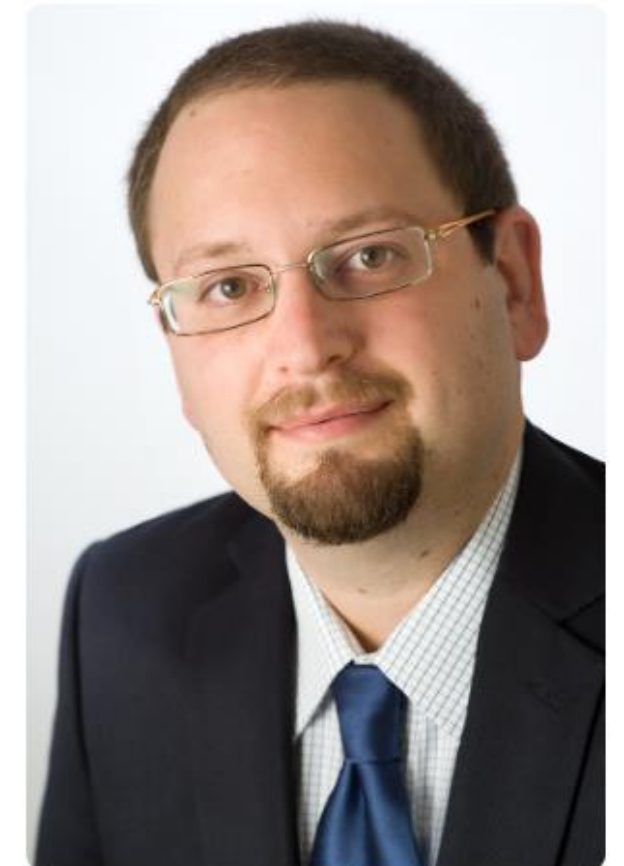
Giorgio Agugiaro

Assistant Professor

Research interests

My main research interests are in the field of Geographical Information Systems and spatial data integration, with particular focus on semantic 3D city models and their energy-related topics. Some of my research topics deal, for example, with the development of an information model to manage and exchange semantically-enriched multi-resolution 3D urban data for urban energy planning. More in general, having a semantic 3D city model as background, the idea is to foster software integration to allow complex urban system simulations and close (or reduce) the gap between geo-information and simulation.

<https://3d.bk.tudelft.nl/gagugiaro/>



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Department of Urbanism

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Environment



3D City Database: KML/Collada/glTF exporter

The screenshot shows Google Earth Pro with a 3D city model. A popup window displays the following data for 'id_building_06':

- Address (only the first is shown):** [CityGML icon]
- Available in:** LoD0, LoD1, LoD2
- Appearances:** 0
- Name:** Amidala's Palace
- Class:** habitation
- Function:** residential building
- Usage:**
- Roof type:** gabled roof
- Measured height:** 15.0 m
- Storeys above ground:** 3
- Storeys below ground:** 2
- Year of construction:** 1997-01-01
- Year of demolition:**
- Existing generic attributes (mouseover for values):**
- External references (mouseover for InformationSystem):**



Giorgio Agugiaro



Rocco D'Elia



Visualizza tutti





Tables CITYOBJECT + BUILDING

Table CITYOBJECT

id	objectclass_id	gmliid	gmjid	name	description	envelope
[PK] integer	integer	character varying (256)	character varying (1000)	character varying (4000)	geometry	
1	1	26	id_building_02	Rey's Hut	This is Building 2	01030000A0407100000100000005000...
2	2	26	id_building_01	Snoke's Palace	This is Building 1	01030000A0407100000100000005000...
3	3	26	id_box_building_25	Box building 25	This is a simple, primastic building meant to provi...	01030000A0407100000100000005000...
4	4	26	id_box_building_28	Box building 28	This is a simple, primastic building meant to provi...	01030000A0407100000100000005000...
5	5	26	id_building_04	Fin's Cabin	This is Building 4	01030000A0407100000100000005000...
6	6	33	id_building_2_roofsurface_1	RoofSurface 1 (Building 2)	This is Roofsurface 1 (South) (Building 2)	01030000A0407100000100000005000...
7	7	33	id_building_4_roofsurface_1	RoofSurface 1 (Building 4)	This is Roofsurface 1 (South) (Building 4)	01030000A0407100000100000005000...

Table BUILDING

id	building	building_root_id	class	class	function	function	usage	usage	year_of_construction	year	roof_type	roof	measur	measur	storeys_above	stor	stor	stor	stor	stor
[PK] integer	integer	integer	character varying (10)	character varying (10)	character varying (10)	character varying (10)	character	character	date	date	character varying (10)	double	double	numeric (8)	num	char	char	char	char	char
1	1	1	habitation	ht...	residential building	htt...	[null]	[null]	1955-01-01	[null]	gabled roof	ht...	15 m	3	0	3.0 m	[null]	[null]	[null]	[null]
2	2	2	habitation	ht...	residential building	htt...	[null]	[null]	1955-01-01	[null]	gabled roof	ht...	15 m	3	0	3.0 m	[null]	[null]	[null]	[null]
3	3	3	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]
4	4	4	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]
5	5	5	habitation	ht...	residential building	htt...	[null]	[null]	1955-01-01	[null]	gabled roof	ht...	15 m	3	0	3.0 m	[null]	[null]	[null]	[null]
6	26	26	habitation	ht...	residential building	htt...	[null]	[null]	1955-01-01	[null]	gabled roof	ht...	15 m	3	0	3.0 m	[null]	[null]	[null]	[null]
7	28	28	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]
8	29	29	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]



Giorgio Agugiaro



Rocco D'Elia



Visualizza tutti





Nahhhh...I don't think I should do something
different...somebody else is cooler!





Commenti

Condividi

File Home Inserisci Layout di pagina Formule Dati Revisione Visualizza Automate Guida Power Pivot

Incolla Appunti Carattere Calibri 11 A A G C S Allineamento Generale Numeri Formattazione condizionale Stili Formatta come tabella Formato Celle Modifica Ordina e filtra Trova e seleziona Riservatezza

Salvataggio automatico

M4

	A	
1		
2	Categorical parameter and items	
3	<i>Building general</i>	Gene
4	name	build
5	address locator	addr
6	coordinates	geolc
7	nature	gene
8	dwelling	hous
9	working	work
10	public	publi
11	interior	this r
12		
13	<i>Building specific</i>	infor
14	use	the main purpose of the specific room
15	dwelling: living room	
16	bedroom	
17	hobby room	
18	basement	
19	exercise room	classification for the "dwelling" category
20	kitchen	

15' coffee break