

Cities and territories New Technologies

First InPrInt Seminar

Partnership Building towards
Stronger Engagement in International Collaboration

UFMG, Belo Horizonte

19-23 November 2018

COMMON GOALS OF THE GROUP

Novel territorial representations in the digital information domain, including the citizen views and collaboration, enabling analyses and simulations of urban dynamics.

Geoinformation for diagnostic and prognostic studies of cities.

New technologies to ensure the information flow required for smart cities.

**Collaborative Territorial
Planning Methodologies
Supported by
(Geo)Information Technology
and Participation**

Partner Institutions (so far)

- POLITO - Polytechnic of Torino / SITi (Higher Institute on Territorial Systems for Innovation);
- Civil Protection Department of Ouro Preto and of Italy
- UFOP – Federal University of Ouro Preto

New collaborations are most welcome!

Conceptual Framework

A - Brazilian urban landscape:

- Licensed landscapes: concentration and verticalization, real estate market forces and frail infrastructure
- Unlicensed urban landscapes: occupation of the portions considered non-buildable and lacking infrastructure.

B – Risk:

- Geological, environmental, social and on landscapes of cultural value.

C – Geoinformation:

- Support for opinions and decision-making
- Enables understanding the reality according to vulnerabilities, potentialities and specificities.
- Visualization tools, popular access through the Web: raise awareness

D – Information technologies:

- Drones to generate dynamic three-dimensional models, and
- Parametric modeling to create of simulations of current and future landscapes, to increase understanding and empower critical views.



Competencies and Expertise

A - Geoprocessing Lab, EA-UFMG

- National reference for its capacity to represent urban problems
- Studies on the use of IT for shared planning, within the Geodesign framework
- Tools include drone captures, 3D modelling and simulations

B – Parametric modeling

- Fundamentally important for the dynamic representation of the urban landscape.
- Uses GIS and geographic information to perform parameterized simulations to predict the future landscape.
- Example: simulate and predict the city that can result from a Master Plan.

Short, medium and long-term goals:

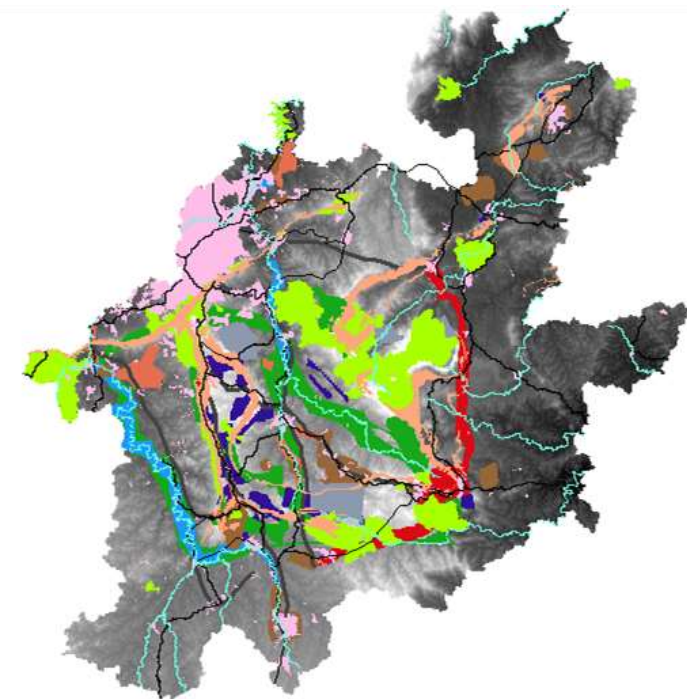
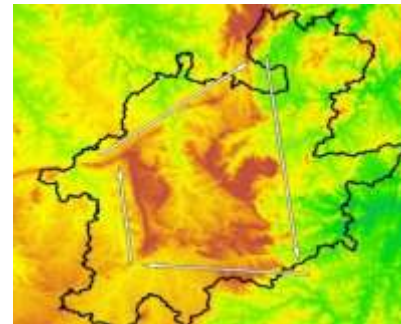
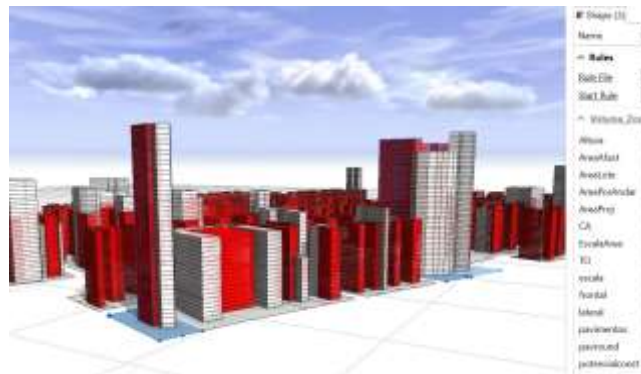
A – Exchange ideas about the participatory processes to create the awareness of responsibility on the value of the territory and the landscape, facing risk-related issues.

Understand the principles of citizen participation, supported by information technologies.

B - Develop methodological procedures and technical support, based on visualization tools.

Explore scenarios and parametric modeling capabilities so that citizens can understand specific characteristics of the territory for or against occupation

Create a critical assessment of the value of the landscape and related risks



INCT Technopolitics: Urban Territories and Digital Networks

- UFMG, UFOP, UFRJ, UFF, USP SC, USP SP, UNILA and UFES
- **Some international partners:** Peer to Peer Foundation: Michel Bawens (founder); Daniel Hernández Nadal (Professor and researcher of the New Territories project); Carlos Hernandez Correa (director PEI - International Program of the Faculty of Arquitectura y Diseño), Daniel Huertas Nadal; Colegio de México (Colmex) - Jaime Erazo Espinosa; Pontificia Universidad Católica del Ecuador: Santiago del Hierro professor and postgraduate coordinator in urban design; Pontificia Universidad Católica del Ecuador: Gary Leggett (Faculty of Architecture and Urbanism); Parsons School: Miguel Robles Durán.

New collaborations are most welcome!

A – Investigate / produce social technology applied to public policies: mobility, housing, leisure, culture, economy, agroecology, etc.

- Increasing urbanization, extends to rural areas
- Expansion of information technology and connectivity, transforms experiences and integrates with infrastructures
- No corresponding incorporation of these resources in city planning: missed opportunity to strengthen the dialogue between citizens and governments

B – TECHNOPOLITICS proposes the collaborative development of open and reinforced social technology

- Open/free source movement, peer to peer communication: free knowledge sharing
- New models of content licensing

C – The widespread dissemination of information is a fundamental premise for sustainable development practices in the country.

A – Academic research, teaching and extension

- Involving graduate and undergraduate students
- Focusing on technopolitics for sustainable and inclusive development
- Associating methods, from cartographic processes to laboratory development

B – Articulation of networks

- Universities, state and society,
- Laboratory development of online collaborative platforms, mobile applications, websites, blogs and other connection devices based on re-applicable social technology.

C – Providing guidelines for the production of urban public policies

- Explore the potential of digital technologies for articulated programs and projects

D – Technopolitical capacity building

- Actors involved in the production of knowledge and urban space
- Public managers, educators, culture points, socially vulnerable communities, neighborhood associations.

Short, medium and long-term goals:

A – Strengthen the existing network through partnerships with international groups

Consolidate and expand the existing network on technopolitics in a systematic and transversal way

B – Enable the joint participation of members of the network in research, extension, scientific events, and the organization of national and international workshops

Reinforce the need to strengthen an Ibero-American network with emphasis in Latin America

INCT TECHNOPOLITICS: URBAN TERRITORIES AND DIGITAL NETWORKS Initiatives



Integration of Spatial Data from Heterogeneous Sources for Urban Computing and Mobility



INTEGRATION OF SPATIAL DATA FROM HETEROGENEOUS SOURCES
FOR URBAN COMPUTING AND MOBILITY

Partner Institutions (so far)

- UFMG Graduate programs: Computer Science, Architecture and Urbanism
- USP: Transportation Engineering Research Group
- New collaborations: to be defined

New collaborations are most welcome!

Conceptual Framework

- A – Global urbanization: increasingly populous cities, need to become more efficient
 - Public transport: essential service that directly affects the quality of living
 - Large volumes of data are generated by various government and transportation agencies
- B – Users in social networks, using smartphones, can enrich the official sources with a range of information, from objective data to personal opinions and sentiments.
 - Challenge: integrate large volumes of spatial data from diverse and heterogeneous sources
- C – Urban Computing
 - Methods and techniques for data collection, integration and analysis of multiple heterogeneous sources of urban data
 - Obtain relevant information about the city
 - Support analysis and decision-making in urban problems

Competencies and Expertise

A – Integrate spatial data from multiple heterogeneous data sources, within the conceptual framework of Urban Computing

- Emphasis on the multimodal urban transport network
- Unstructured data sources, such as social media
- Data on static or dynamic aspects

B – Integrate official data sources to crowdsourcing and crowdsensing

- Transit system: routes, schedules and timetables integrated to crowdsourcing, crowdsensing, volunteered geographic information
- Data from unofficial online sources
- Novel analyses, visualizations and applications

Short, medium and long-term goals:

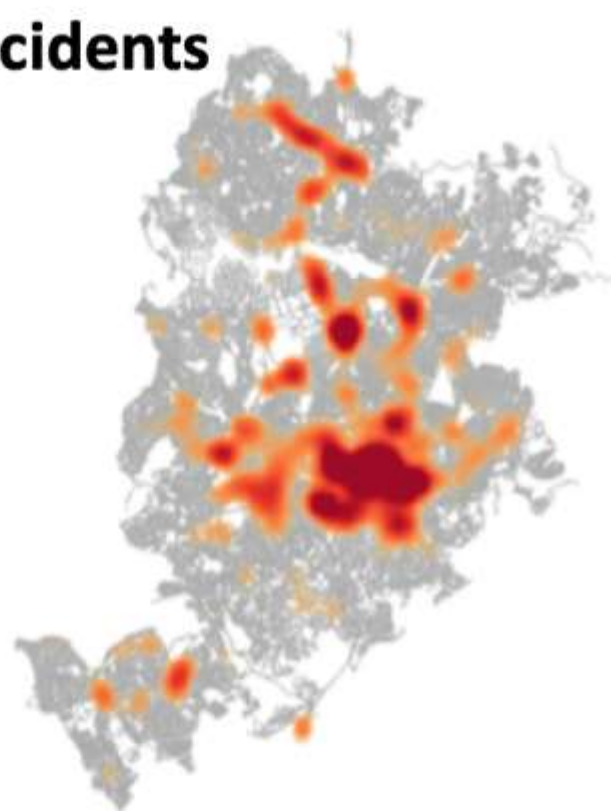
A – Methods and techniques for spatial and temporal data collection, transformation and integration

Common ground for static (transit lines, itineraries, schedules, traffic rules) and dynamic (GPS tracks, traffic jams, social media postings) sources

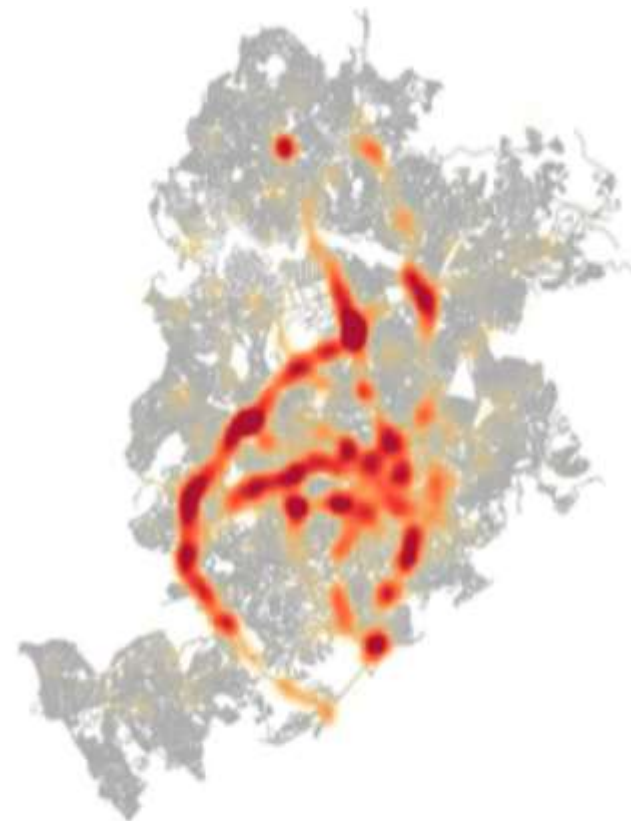
B – A working model of a city's transportation and transit network

Simulation, creation of scenarios, integration of dynamic and crowdsourced information, planning, forecasting

Traffic Accidents



a) BHTrans



b) Waze

9% overlap between these two sources
3 times more accidents recorded by Waze users than official records

INTEGRATION OF SPATIAL DATA FROM HETEROGENEOUS SOURCES FOR URBAN COMPUTING AND MOBILITY

Initiatives



In Belo Horizonte, routes from downtown can be up to 80% longer in a bus than by car,
and buses run at half the car's speed

Optimizing Smart Cities Service Networks

Partner Institutions (so far)

- Institutions: UFMG, Production Engineering Graduate Program
- New collaborations: to be defined

New collaborations are most welcome!

Conceptual Framework

A - "Smart city": a new perspective that proposes connecting different sectors of the society via the Internet of Things (IoT) and distributed computing technologies

- Integrate and facilitate the management of resources, bureaucratic processes, and services
- Transportation, health care, commerce, education, water, energy and law enforcement

B - Pressure for faster, better and on demand city services

- Smart City: smarter and connected communities that are technologically led and have a citizen-centered-government approach

C – Service networks impact the standards of urban living and play a major influence in a city's infrastructure and economy.

- Urban technology network
- Integration of city planning and the transportation network
- Energy distribution network
- Health service network
- Water, wastewater and waste treatment network

Competencies and Expertise

A - Normative Quantitative Axiomatic Research method

- Common in combinatorial optimization and operations research investigations
- Primarily oriented to model idealized problems
- Normative because it is based on models that prescribe a decision to a problem

B – Research development based on

- Organization of data collection
- Problem modeling
- Mathematical program formulation
- Specific solution method design
- Analysis of results and discussion
- Open source decision support system development

Short, medium and long-term goals:

A - Functional solution methods embedded within open source decision support systems

Projects by Area: Architecture And Urbanism

Dimension	Description
Title	Study, critics and intervention on cultural heritage in Minas Gerais – development of instruments and methodologies
Faculty/Research group	School of Architecture and Urban Planning & Fafich, UFMG
Problem statement	The urgency of a critical reflection on interventions in several cultural heritage examples existing in Minas Gerais, as well as the need to review Brazilian architecture historiography. To face the lack of specialised technical training of survey resources by means of high-level technologies such as photogrammetry and the use of laser scanning equipment, as well as investigations on problems and solutions for facing pathologies.
Objective and sub-objectives	To promote the study, critics and discussion upon the necessary elaboration of intervention guidelines to preserve cultural assets in Minas Gerais, promoting the development of appropriate tools and methodologies, based on the exchange of experiences between the two countries.
Conceptual Framework	Cultural heritage, data capture and registration about historiography and existing buildings and its pathologies, photogrametry and laser scanning.
Methodology	History and historiography of Art and Architecture. Materials, techniques and construction systems. Major pathologies and degradation, restoration, recovery and conservation systems. Preservation of cultural heritage, its legal and theoretical basis . Systems and instruments for surveying and diagnosing on cultural assets for the purpose of designing intervention and restoration projects.
Main Results	Cultural heritage preservation is not yet sufficiently established regarding technical, methodological and

Projects by Area: Social sciences, cities and technologies

Dimension	Description
Title	Public space and urban mobility: policies, spaces, and uses of mobility systems
Faculty/Research group	Center for Urban Studies, PUC Minas, Intalinc.lac UCL (UK), UNAL- Bogotá
Problem statement	Public spaces constitute one the most important components of the Mobility systems. But a few studies have been conducted on the relationship between the integration between transport infrastructures and urban spaces.
Objective and sub-objectives	The aim is to compare the implementation process of different systems of urban mobility in Bogotá and Belo Horizonte, in terms of the role of public spaces in the articulation of transport infrastructure and urban space. For such purpose, our proposal compares 1. Discourses that oriented urban mobility. 2. Spatial arrangements of mobility projects. 3. Urban daily mobility practices of users of the systems
Conceptual Framework	Political arrangements that guide the production of mobility systems, urban space, government and institutions and cognitive support given to the decision. Mobility Turn: A relational perspective of comprehension of time and space.
Methodology	Discourse analysis of mobility policy about the relationship between mobility system and public space. (Spatial analysis (ArcGIS, google earth, google maps) and field observation, Fieldwork (ArcGIS, QGIS, google maps), Surveys and Users Interviews (SPSS)
Main Results	Mobility spaces are disintegrated of urban spaces, particularly public services and public spaces

Projects by Area: Social Sciences, cities and technologies

Dimension	Description
Title	Time, space and constitution: critical perspectives and dogmatic unfolding
Faculty/Research group	Postgraduate Program in Law, Universities Baltimore, USA, Kent, United Kingdom, University of Pretoria, South Africa, University of Westminster; University of Frankfurt
Problem statement	The predominance of extreme concentration and verticalization, resulting from the forces of the real estate market and the fragility of the existing infrastructure. The loyalists of the struggle for rights can develop researches to provide visibility to the potential conquest of equality and freedom for all, such as a paradoxical process, of constant learning and subject to retreats
Objective and sub-objectives	Contribute as a form of teachers, investigators and disciples capable of reflecting and adopting in their professional practices the concepts set forth in the decolonial and libertarian perspective; ii) Contribute as scientific, dissemination and academic production on decolonizing laws theories, feminist methodologies on the right, spatial and temporal spatial thinking..
Conceptual Framework	Main thematic to be studied: right, space, territory, body, history, and heterotopies; the decolonial and libertarian perspective; Decolonizing laws theories, feminist methodologies on the right, spatial and temporal spatial thinking
Main Results	Formation of 6 doctors - Formation of 14 másters. Publication of 20 national articles - Publication of 8 international articles - Publication of 4 national collective briefs - Publication of 2 national collective briefs - Publication of 6 individual bills. Performance of 4 national events - Realization of 2 international events.

Projects by Area: Social Sciences, cities and technologies

Dimension	Description
Title	Public Policies and Territorial Development
Faculty/Research group	PPGHIS, - PPGCOM, University of Helsinki and University of Jyvaslyla - Finland, IPEA, CNPq, Fapemig
Problem statement	The operationalization of policies involves the question of the political and administrative structure of the country. Who is to propose, implement, monitor and evaluate these policies? Which are the existing interfaces, pacts and arrangements between government agents responsible for these policies? What is the role of civil society in this field?
Objective and sub-objectives	<p>To investigate the relationships and interactions between public policies and territorial development, on different scales, clippings and approaches.</p> <p>To use the New Information and Communication Technologies (NICT) to provide access to databases and analyzes related to Brazilian territorial development, for government managers, researchers and the general public.</p> <p>To develop technologies and methodologies that encourage social participation, especially with the use of NICT.</p>
Methodology	Development of different informational platforms for different user profiles, involving the organization, systematization and integration of databases of different thematic axes.
Main Results	Production, dissemination and analysis of socioeconomic and social-environmental indicators and looking for (1) to disseminate knowledge for civil society and . government managers, (2) to favor the production of knowledge and, in the process, the appropriation of these tools.

Projects by Area: Social Sciences, cities and technologies

Dimension	Description
Title	Process of Planning and Appropriation of Sports, Leisure and Culture Public Spaces: Parallels and Transfers between the Urban Realities of Brazil and Portugal
Research group	Federal University of Paraná, University of Aveiro.
Problem statement	<p>The research problem is: To what extent is the planning model of public spaces for sport, leisure and culture in Portugal based on certain paradigms and how does it relate to other capitals in Brazil?</p> <p>I raise the hypothesis that the model of public spaces adopted by Aveiro and other Portuguese cities is centered in a paradigm of urban planning marked by the interest in creating an identity brand. This process of planning and appropriation of the public spaces of sport, leisure and culture can indicate parallels and transfers between the urban realities of Brazil and Portugal.</p>
Objective and sub-objectives	<p>General objective: to understand the relationship between different capitals of Brazil and Portugal regarding the models of public spaces destined to the experiences in the ambit of Leisure, Sport and Culture, its process of conception, planning and appropriation.</p> <p>To situate urban planning issues in the city of Aveiro, verifying the paradigms that support urban planning today, in an attempt to focus on the adopted model of public spaces in the city, reporting some of its peculiarities in other Portuguese cities; to characterize the public spaces of sport, leisure and culture of the city of Aveiro, verifying what influenced their creations, what their characteristics, what their activities, what contradictions exist in spaces, which are the broader networks of relations between users, spaces and public management.</p>
Methodology	Qualitative research in the field of cultural studies, characterized by an ethnography with observations and interviews with the population and public managers.
Main Results	Production of articles, monographs, dissertations, theses.

Projects by Area: Social Sciences, cities and technologies

Dimension	Description
Title	Behind the Camera: Film-induced Tourism in Minas Gerais, Brazil
Research group	CNPq (2018-2021)
Problem statement	For several decades, the territory of Minas Gerais has leased several audiovisual productions, such as films and telenovelas. In order to further promote audiovisual production in the State, stimulate research and encourage the adoption of new languages that reveal the diversity of Minas Gerais culture, in 2004 the State Department of Culture created the "Film in Minas" Program. For a film to be supported by the Program, at least 60% of the filming must happen in Minas Gerais. By disseminating the culture and landscapes of Minas Gerais through Brazil and other countries, fiction films or documentaries can boost tourism in the State.
Objective and sub-objectives	This research has, as a general objective, to analyze audiovisual works supported by the Film in Minas Program in the context of Film-induced Tourism. Specific objectives: (a) To investigate, in this cinematography, which elements enhance tourism in the State of Minas Gerais, and (b) to discuss how culture and hospitality in Minas Gerais are portrayed in the films supported by the Program, hospitality, gastronomy, leisures and landscapes.
Methodology	This qualitative research includes a bibliographic study, film analysis of films supported by the Film in Minas Program and interviews with directors, members of the technical team and managers of the State Secretariats of Culture and Tourism.
Main Results	Production of articles, dissertations, theses. Systematization of knowledge on Film-induced Tourism based on audiovisual productions analyzed.

Projects by Area: Health

Dimension	Description
Title	Challenges of intersectoriality in the context of high social vulnerability
Faculty/Research group	Faculty of Dentistry, UFMG
Problem statement	Characterizing and mapping the area of coverage of the basic health units will be relevant to know and plan the service based on the reality of the population.
Objective and sub-objectives	To evaluate the challenges of intersectoriality in the context of the territory of Basic Health Units located in areas of high social vulnerability.
Conceptual Framework	Researchers must consider social determinants to better understand the dental condition of the population.
Methodology	Academic research associated with teaching and health public policies. Articulation of networks. Production of knowledge.
Main Results	A broad range of social determinants, not only biological risk factors and individual lifestyle can influence the oral health of the population.

Projects by Area: Health

Dimension	Description
Title	Social capital, social determinants and oral health in a metropolitan area of Belo Horizonte, southeastern region of Brazil
Faculty/Research group	Faculty of Dentistry, UFMG
Problem statement	Social capital and social determinants can have an important role in the oral health of individuals living in a context of a country where inequalities have been a reality.
Objective and sub-objectives	To analyze the factors related to social capital and social determinants in the perspective of individuals from the metropolitan area of Belo Horizonte, southeastern region of Brazil.
Conceptual Framework	Dentistry should be directed to distal factors, such as social capital, to gain a better understanding of oral health being linked to social determinants.
Methodology	Academic research associated with teaching and health public policies. Production of knowledge.
Main Results	Social capital is an important tool in the implementation of more effective public health policies.

Common Ground: Overarching research issues and questions

- A – **Digital information and IT:** Geographic Information Systems, Geoprocessing, Internet of Things, Crowdsourcing, Collaborative Platforms, Web-based Planning Support Systems, Parametric Modeling, 3D and 4D data capture and representation;
- B – **IT methods** in representation, analysis, simulation and support to opinion and decision making for territorial planning;
- C – **IT models** conceived towards the concepts of Smart Cities;
- D – **IT tools and techniques** to promote citizen participation and to understand their values and expectations;
- E – **Methodologies for the analysis and presentation** of novel results, based on visual analytics.

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TEMA 2: NOVAS TECNOLOGIAS E FRONTEIRAS DA CIÊNCIA	
Projeto 2.10: Cidades e territórios	
Articulador:	
PPG	Docentes indicados
Sociologia	Ana Marcela Ardila Pinto
Letras: Estudos Literários	Maria Juliana Gambogi Teixeira
Comunicação Social	Regina Helena Alves da Silva
História	Regina Helena Alves da Silva
Ciência da Computação	Clodoveu Davis
Arquitetura e Urbanismo	Ana Clara Mourão Moura
Direito	Daniel Gaio
Administração	Profa. Marlusa Gosling de Sevilha
Engenharia de Produção	Ricardo Saraiva de Camargo
Odontologia	Ana Cristina Borges Oliveira
Estudos do Lazer	Christianne Luce Gomes
Economia	Roberto Monte-Mór
Ambiente Construído e Patrimônio Sustentável	Maria Luiza de Castro

SESSÃO CONJUNTA Projeto 2.10: Cidades e territórios e Projeto 4.6: Cidades, territórios e direitos humanos	
Com apresentação	
Prof Hayden Lorimer	University of Glasgow
Hokyong Shon	University of Technology Sidney