25th International Lab Meeting – 20th Summer School 2014
13th – 19th July 2014, Rome (Italy)

Key Lecture

Genesis, development and actuality of the Social Representation theory in more than fifty years (1961-2011 and beyond): the main paradigms and the "modelling approach"

SAPIENZA
UNIVERSITÀ DI ROMA

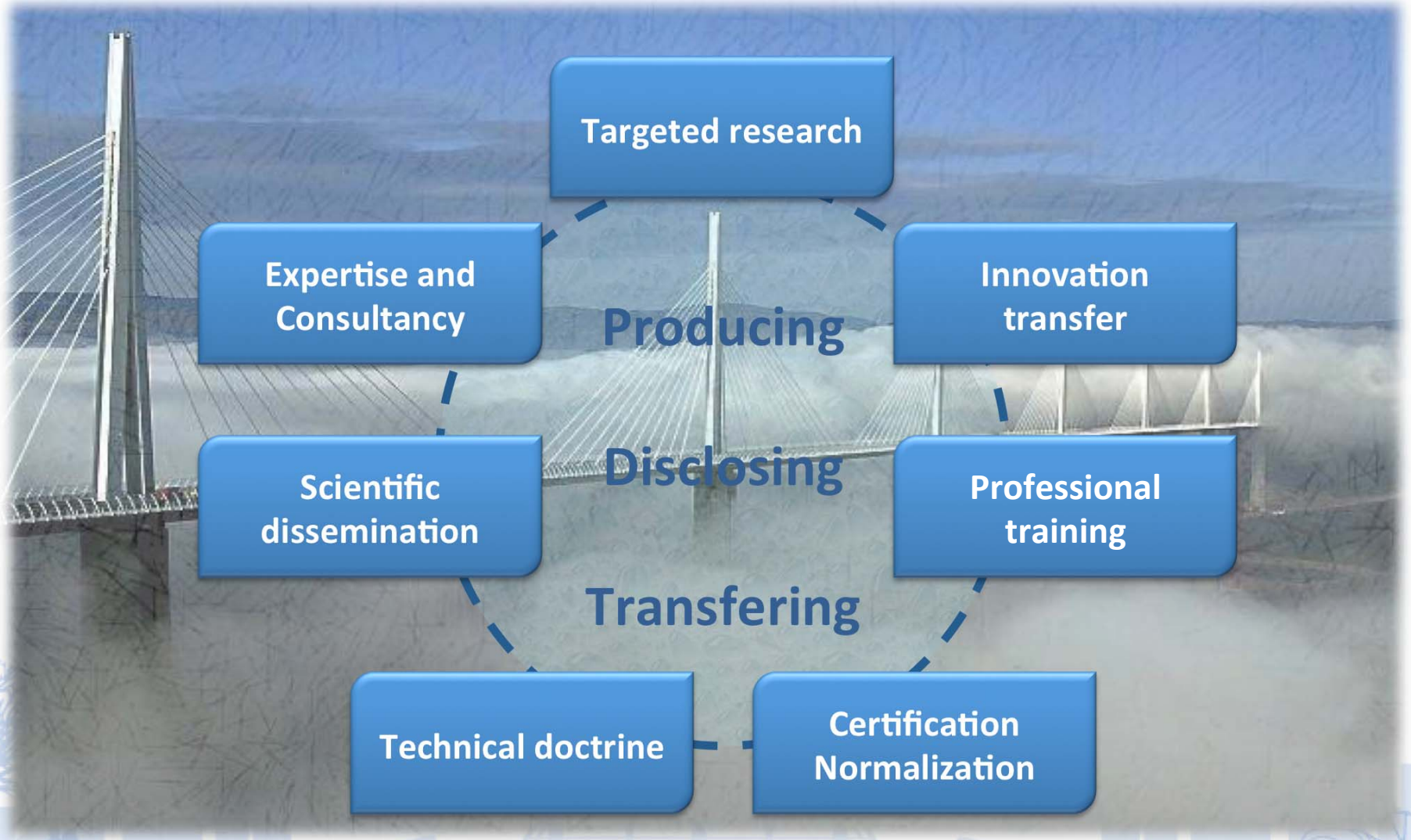
European/International Joint Ph.D.
in Social Representations and Communication

Institut français
des sciences et technologies
des transports, de l'aménagement
et des réseaux

Main application fields of research and expertise at Ifsttar

IFSTTAR

Ifsttar missions



Field of applications

MULTIDISCIPLINARY

Engineers sciences
+
Human and social sciences
+
Life sciences

- Civil engineering and building materials
- Natural hazards (characterization and impacts)
- People and goods mobility
- Safe transport systems
- Impacts of transport systems





Key figures

- Staff : 1260 employees (380 PhD students)
- Annual budget : 103 M€
- > 370 scientific publications
- > 80 defended PhD
- 80 patents
- 150 research programs (50 European projects)
- 110 technical expertise's

(2012 figures)

Science strategy

4 strategic guidance :

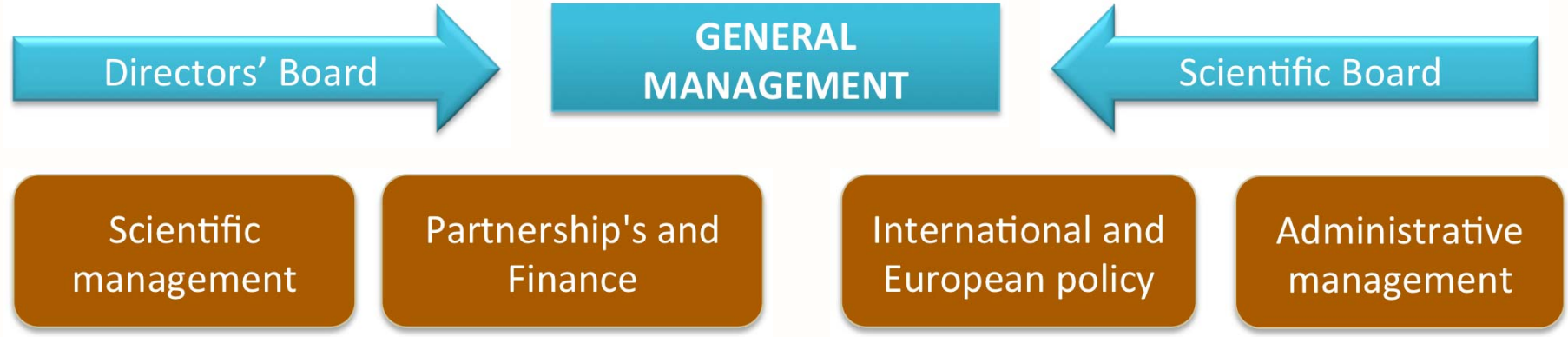
- imagining sustainable mobility
- adapting the infrastructure
- managing and controlling natural hazards

impacts, environmental impacts

- imagining future cities and territories plans

Observation, test, analysis and modelling
for a better comprehension and a relevant innovation.

Governance and organization



Five departments

MAST	GERS	COSYS	TS2	AME
Materials and Structures	Geotechnics Geosciences Natural Hazards	Components and systems	Transport, Health, Safety	Spatial Planning, Mobility & Environment
230 p	*98 p*	*260 p*	*140 p*	*105 p*

A department merges research laboratories and joint research units

Standard contract forms

Framework agreements :

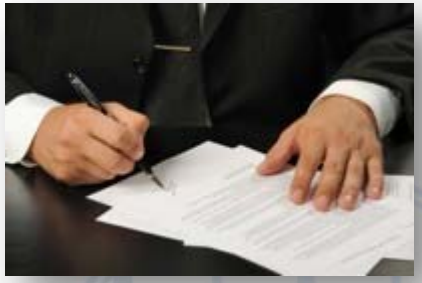
- Legal and administrative framework + development and coordination of cooperation

Research contracts :

- Cost-shared researches agreements
- Cost-shared Hard/Soft developments
- Industrial chairs

Provision of services :

- Expertise / Technical Advise and Support
- Testing / Modelling
- Certification
- Professional Training



Others :

- Researches financed by public funding
- Foundations (*sponsorships*)
- Licensing contracts
- Start-up
- Individual researcher mobility (exchanges)
- Joint research structures

Components & Systems

Urban Monitoring

- Innovative sensors for sustainable cities
- Smart sensor networks
- Cities energy efficiency
- Air quality and ground pollution monitoring
- Urban networks control

Transport Management skills

- Security/Safety systems
- Railways Control-Command simulators
- Transport supervision tools
- Safe and reliable dedicated ICTS skills (wireless systems, beacons, antennas, warning systems…)

Software

- Dedicated Software Development / Middleware / Software security
- Finite element modelling
- Driving-simulation
- Traffic simulation
- Fluid-inversion
- Multimodal simulation including behavioural data

Civil Engineering monitoring tools - Innovative structures

- Inspection wireless sensors
- Drone-inspection
- Structural health monitoring
- Imaging methods
- Smart lightweight composite bridges
- Concrete railway infrastructure

Energy, Environment

- Electromobility power electronics design and reliability (Batteries, U-Cap,…)
- Eco-driving
- Technological tools/new services for alternative mobility

Cooperative Mobility

- All-weather /All time vision,
- Perception, simulation, navigation, automation skills
- Real-Time Traffic Control systems
- Technologic and Infrastructure evaluation

Transport, Health & Safety

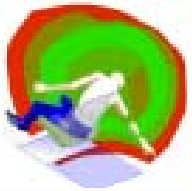
Identification of risk factors

Building and exploitation of accident databases
•Epidemiology
•In-Depth Accident Studies (IDAS)

Simulations and accident reconstitution

- Impact tests
- Structures Modelling
- Biomechanical Modelling

Research and Solutions Assessment



- Ergonomics
- Observation and survey of drivers' and vehicles' behaviours
- Assessment of safety systems
- Evaluation of public policies (epidemiology)

Distinctive approaches

- Safety of rail transport
- Persons with reduced mobility
- Vulnerable Users
- Risks at work

Spatial Planning, Mobility & Environment

Observe, understand and forecast mobility

Mobility of persons / goods

- Mobility characteristics
- Stakeholders roles/contributions/lobbies
- Socio-economical factors
- Users' practices

Spatial Planning

- Transport systems organization (networks and services) + interaction with infrastructure and urban planning (metropolisation)
- Networks economy
- Modelling of urban socio-economics systems

Environmental Impacts

- Environmental impacts of transport systems (greenhouse gas emissions, noise and air pollution in cities, biodiversity damages …)
- Skills for designing, optimising and assessing solutions (technologic ones as electromobility and dedicated public policies)
- Annoying perception, acceptability and appropriation of solutions, "green" behaviours assessment
- Environmental indicators development (dedicated LCA : Life Cycle Analysis, car fleet's emissions tools…)

Example of cross departments collaboration:
On-road electromobility

Smart grids

Public policies/ Stakeholders

Acceptability / Appropriation

Optimisation / Usage

New driving behaviours

Economy/ taxation

Environmental impact

Infrastructures improvements

Safety

Multidisciplinarity & Interdisciplinarity driven by a “research exchange group” of Ifsttar

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IFSTTAR and doctoral training

IFSTTAR

A major component

- **Doctoral training is an essential component of the life of the Institute :**
  - **Resourcing research topics and research teams**
  - **Improve the rates of publications**
  - **Fosters links with the academic world.**
- **Its success is even a measure of the attractiveness of the Institute.**
- **For PhD students, IFSTTAR offers a great environment :**
  - **Acquisition of new skills with a complete first experience of research**
  - **A good future employability : research at IFSTTAR is applied so the future career can be in the academic as well as in the industrial environment.**

Key figures

- 380 PhD students
- 100 new students each year
- Funding:
  - 35% of doctoral contracts are financed or co-financed by Ifsttar
  - 24% of theses are on public funds, but recruited by our joint laboratories or foundations
- In 2012, 92 defended PhD, median PhD duration 3,3 years
- In 2010 and 2011, 95 % of students get a job in the year after their defense (62 % of them on a permanent position).

IFSTTAR and the European/International Joint PhD in Social Representations and Communication

- IFSTTAR is partner of the European PhD on Social Representation and Communication since 2008.
- 3 excellent young researchers received at IFSTTAR : 2 Romanian and 1 French.
  - Ambitious research projects (national and european).
  - A lot of publications of high level of quality.
  - A lasting collaboration.

IFSTTAR and the European/International Joint PhD in Social Representations and Communication

- Carine Pianelli :
  - 2007 European PhD: Norms and social representations in driving (structural approach), European PhD on Social Representations and Communication.
  - 2008 PhD: Représentation sociale de la vitesse chez les conducteurs et pratiques du Limiteur s'Adaptant à la Vitesse Autorisée (LAVIA) : Genèse d'une représentation sociale, dynamiques représentationnelles et relations entre représentations (Tutor IFSTTAR: Farida Saad, GRETTIA)
  - 2003-2007: LAVIA project (DSCR - Directorate of Road Safety and Traffic) : Intelligent Speed Adaptation System.
  - Created its job of consultant.

IFSTTAR and the European/International Joint PhD in Social Representations and Communication

- Grigore Havarneanu :
  - 2008-2011 European PhD: Driver's social representation of death as an outcome of road traffic accidents (Tutor IFSTTAR: Farida Saad, GRETTIA)
  - 2012-2013 LPC, Associate researcher: RESTRAIL (Reduction of Suicides and Trespasses on RAILway property) European project
  - Since 2013: Research advisor at International Union of Railways - Lecturer at Transilvania University

IFSTTAR and the European/International Joint PhD in Social Representations and Communication

- Mioara Cristea :
  - 2011-2012: Post-doctoral researcher at LPC « Mobility, driving and personnality » A quasi experimental behavioural study on risk-taking among French drivers and cyclists.
  - 2012-2013 LPC, Associate researcher: CO-DRIVE project (DGCIS - French Ministry of Industry) about cooperative driving system. Study of eco-friendly driving behavior, acceptability of on-board traffic information, automatic speed enforcement, speed behavior.

IFSTTAR and the European/International Joint PhD in Social Representations and Communication

- Perspectives for future collaborations:
  - Explored research subjects:
    - Route choice during traffic disruption in public transit, impact of information – partners: SNCF (French national railway company) and SystemX (technological research institute)
    - Integration of a new traffic supervision technology (cooperative ITS) in the activity of road operators – partners: French Ministry and Ile de France Interdepartmental Road Directorate (DIRIF)
    - How can shared mobility be integrated in people habits? – partners: some Start-up

Three joint research lines between IFSTTAR and Sapienza University within the European/International Joint PhD in Social Representations and Communication

- **Environment, urban mobility and sustainability**
- **Environment, People, Transportation, ICT and the social impact of new forms of communication by ubiquitous mobile devices and geolocalization:**
  - **The impact of the social networks (Twitter) on transportation**
  - **The crowdsourcing in transportation**

Joint research lines between IFSTTAR and Sapienza University

Environment, urban mobility and sustainability

- **Objectives:** Mapping cities structure and itineraries “above” and “under” the urban surface: preferred mobility practices, multimodal-choices of transportation systems and social representations of sustainable ecosystem in residents, tourists and public transport drivers
- **Description:** Empirical study on multimodal-choice between private and public transportations and urban itineraries: social representations and preferred mobility practices by multi-agent citizens (residents, tourists and public transport drivers)

Joint research lines between IFSTTAR and Sapienza University

The impact of the social networks (Twitter) on transportation

- **Objectives:** Studying the impact of social networks (Twitter) on transportation: social representations of the transportations service by the retrospective tracking of sentiment, opinions, attitudes, and geolocalized estimation about the use and state of a transportation network.
- **Description:** The interdisciplinary study will imply:
  - a) the use of an integrated methodological protocol to understand the reasons and motives of the traveler at the individual level to send the information and opinion in their social network and also to look at the process of diffusion trough the network by retweets and the use made of such information by other users. Two situations will be contrasted: normal daily transport situations, exceptional transport situations (big events) and degraded transport situations due to incident or accident;
  - b) Contacts with the main urban transportation providers (SNCF and RATP) in order to identify their willingness to collect and treat these data (sensing and mining) in order to extract useful information in different transportation situations;
  - c) Confrontation of those practices within and between different modes of transport to analyze their acceptability from functional, organizational and social points of view.

Joint research lines between IFSTTAR and Sapienza University

The crowdsourcing in transportation

- **Objectives:** Studying the crowdsourcing in transportation: from B2C models to the two ways of instant information between users and provider of transportation services in real time
- **Description:** The interdisciplinary study will imply:
  a) Contacts with the main urban transportation providers (SNCF and RATP) in order to identify their willingness to get structured information from the users or consumers about the actual state of the transportation system. Such app as “tranquilien” (SNCF) exists already to get data about the occupancy of the wagons on suburbs train lines in real time;
  b) Use of an integrated methodological protocol to understand the willingness at the individual level to give such kind of information directly to the service provider or to share this information through a platform, and the trade-off between privacy and individual and collective benefits in terms of mobility;
  c) Confrontation of those practices within and between different modes of transport to analyze their acceptability from functional, organizational and social points of view. The main point could be the confidence in this information according to the sources and the checks.