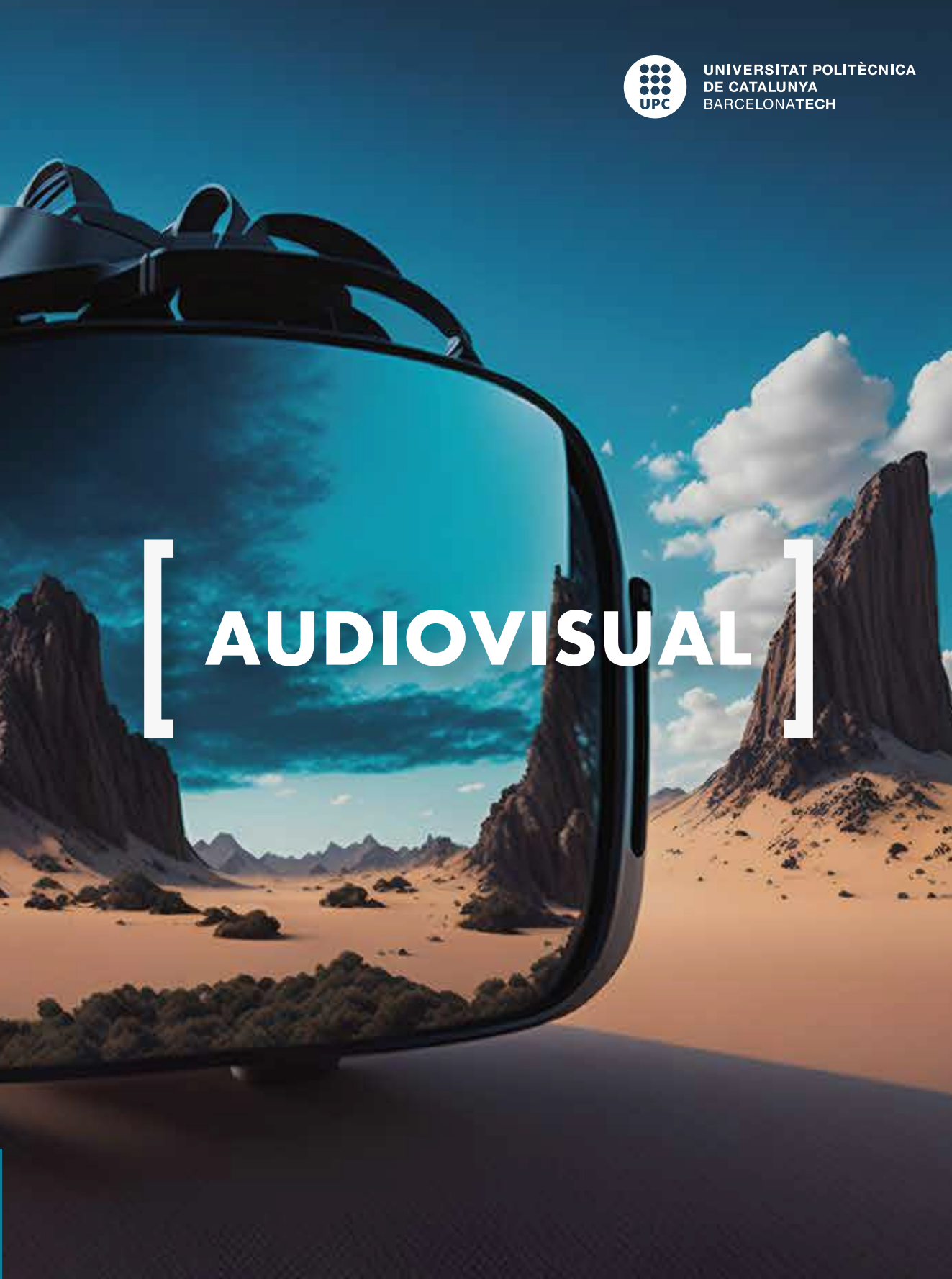
UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH



[AUDIOVISUAL]

RESEARCH, DEVELOPMENT & INNOVATION AT THE UNIVERSITAT POLITÈCNICA DE CATALUNYA - BARCELONATECH (UPC)

The Universitat Politècnica de Catalunya - BarcelonaTech (UPC) specialises in the fields of engineering, architecture, science, and technology, including technologies applied to the audiovisual sector. In this field, the main focus areas are:

- Human–machine interaction and immersive experiences
- Intelligent image, video, and multimedia content processing
- Language, speech, and accessibility technologies
- Environmental acoustics and sound engineering
- Data, AI, and predictive systems
- Communications, streaming, and digital infrastructure
- Specialised infrastructures

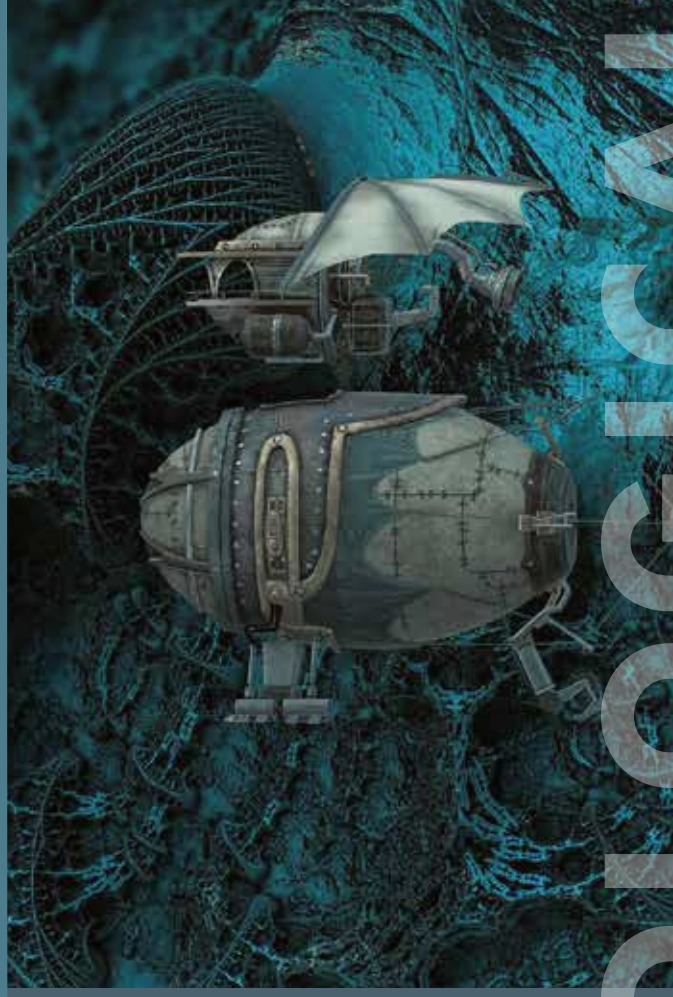
As a result of the UPC's recognised research track record in its areas of specialisation, we can offer a wide range of services:

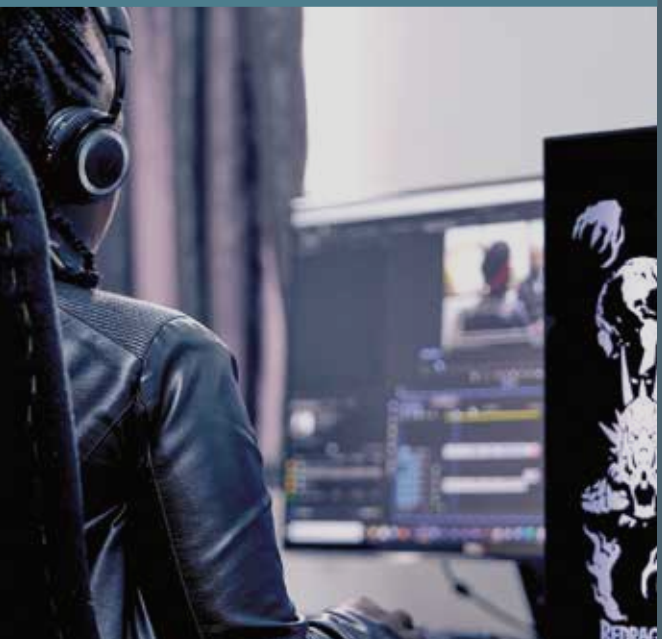
- R&D technology transfer projects
- Consortia for national and Horizon Europe projects
- Patents
- Technology assessment
- Specialised facilities

The UPC is a leading university in Spain in volume of research and technology transfer to companies, and has become one of the major hubs of knowledge in Southern Europe.

HUMAN–MACHINE INTERACTION AND IMMERSIVE EXPERIENCES

- Design and validation of highly realistic virtual, augmented, and mixed reality applications
- Advanced real-time rendering and visualization
- 2D/3D modeling and animation (people, crowds, physical elements)
- Immersive interaction with multisensory feedback (haptic, auditory, proprioceptive)
- Usability design and analysis of applications, video games, and immersive interfaces
- Serious games and gamification
- Simulation of complex environments and scenarios
- Creation of visual digital twins
- Immersive narrative experiences (interactive documentary, procedural storytelling)
- Photography and digital heritage: optimized processes for dissemination, digital museums, and scientific analysis





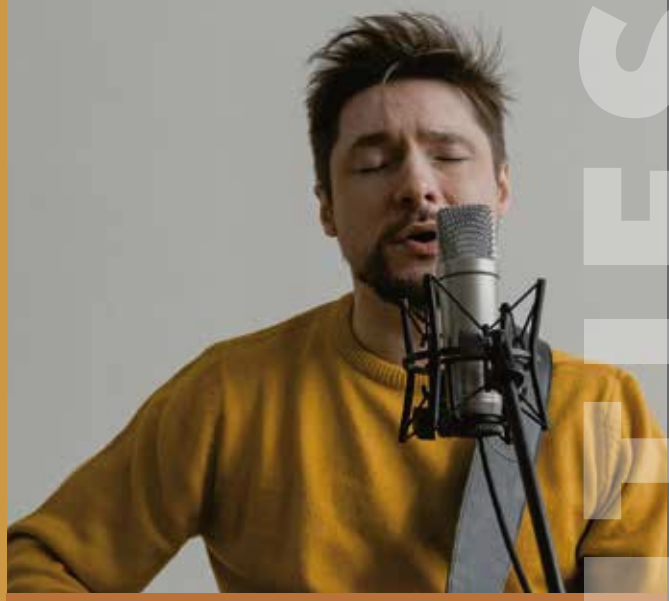
INTELLIGENT IMAGE, VIDEO, AND MULTIMEDIA CONTENT PROCESSING

- Image and video processing using AI and deep learning
- Action analysis and pattern recognition
- Real-time video analytics
- Automatic generation of clips and audiovisual content
- Geometric processing and procedural modeling
- Automatic content annotation and indexing

TECHNOLOGIES

LANGUAGE, SPEECH, AND ACCESSIBILITY TECHNOLOGIES

- Multilingual automatic speech recognition
- Automatic transcription and subtitling
- Natural language processing and multimodal models
- Speech-to-sign-language translation
- Analysis, detection, and localization of acoustic events
- Speech enhancement, adaptation, and synthesis (Text-to-Speech, TTS)
- Affective computing and emotion analysis
- Speech processing in complex environments (microphone arrays, multiple speakers)



ENVIRONMENTAL ACOUSTICS AND SOUND ENGINEERING

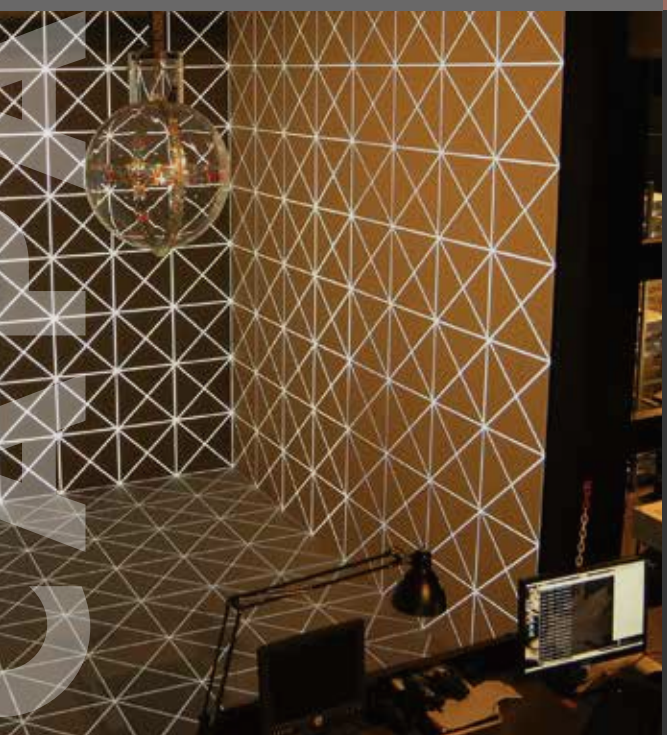
- Acoustic characterization of outdoor and indoor spaces
- Development of noise maps and capacity maps
- Design of acoustic action plans
- Design and operation of low-cost acoustic sensor networks
- Acoustic impact analysis of leisure infrastructures

DATA, AI, AND PREDICTIVE SYSTEMS

- Big Data applied to multimedia
- Audience and behavior prediction
- Machine learning and complex data mining
- Multimodal machine learning
- Audiovisual Business Intelligence
- AI-based optimization
- Computational efficiency algorithms

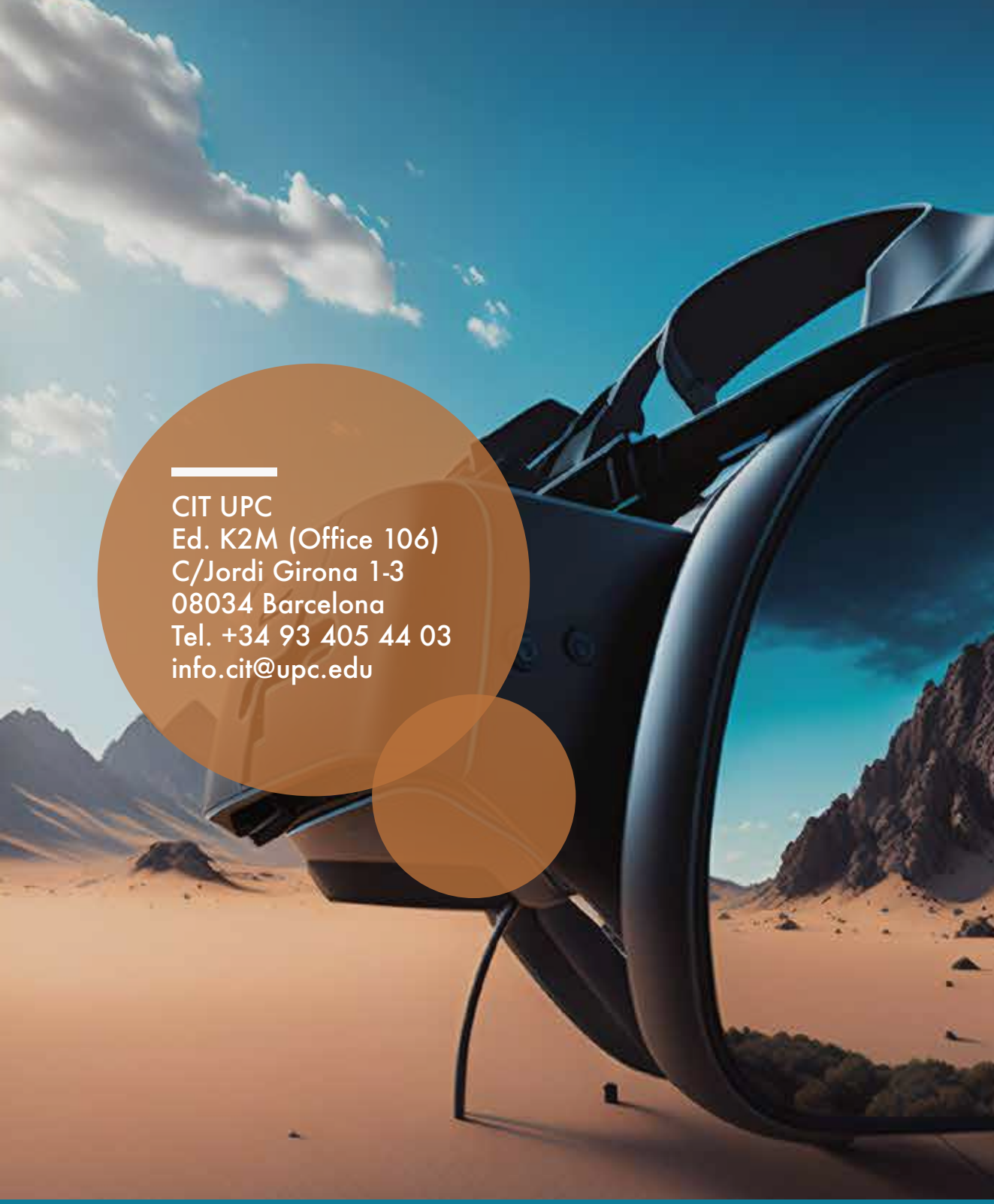
COMMUNICATIONS, STREAMING, AND DIGITAL INFRASTRUCTURE

- Advanced mobile networks (5G/6G) for multimedia transmission
- Real-time streaming and broadcasting technologies
- Audio and video integration in intelligent multimedia systems
- IoT and Edge Computing for audiovisual applications
- Protocols and networks for efficient transmission
- Cybersecurity in audiovisual environments
- Optimisation of audiovisual communications and advanced encoding
- Systems for smart buildings and interactive spaces
- Recording and georeferencing of virtual objects in the real world
- Optical systems for virtual, augmented, and mixed reality



SPECIALISED INFRASTRUCTURES

- Cave Automatic Virtual Environment (CAVE): full virtual immersion environment
- Stereowall and large-format displays
- High-speed 3D scanner
- Human–Computer Interaction Laboratory with eye tracking



CIT UPC
Ed. K2M (Office 106)
C/Jordi Girona 1-3
08034 Barcelona
Tel. +34 93 405 44 03
info.cit@upc.edu

www.cit.upc.edu

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