Digital & Movement Sciences for Health



Explore this IDIL Master's track in detail, including its academic objectives, curriculum, research opportunities, admission requirements and career prospects.

TRACK OVERVIEW & LEARNING OBJECTIVES

The **DigiMove Master's program** is an interdisciplinary graduate program designed to train students at the crossroads of **human movement sciences, experimental research, and data science**. The curriculum combines advanced coursework with long-term internships, providing strong foundations in research, digital technologies, and applied innovation for **sport and health**.

Backed by a **network of internationally recognized research laboratories in the Montpellier region**, students work closely with academic staff and research teams. The program offers **highly personalized training paths**, allowing students to align their studies with individual academic and professional goals.

DigiMove is part of the **IDIL excellence track (Master's + PhD)** at the **University of Montpellier**, preparing future researchers, engineers, and PhD candidates in **movement engineering, ergonomics, and digital technologies for sport and health applications**.

Key Highlights

- **Project-based, hands-on learning**
- **Extended research internships** (5 + 5 months)
- **Individual mentoring and academic supervision**
- **Strong focus on autonomy, innovation, and research excellence**

KNOWLEDGE, SKILLS & COMPETENCIES

Research-Oriented Program Structure

The DigiMove Master's program is built around **three core research domains**, providing rigorous methodological and theoretical training for careers in **academic research and doctoral studies**:

• **Experimental Research Methods**
Students are trained in the full research process, including **research ethics**, **experimental design**, **measurement systems**, **statistical modeling**, and **mathematical tools** for quantitative analysis. Strong emphasis is placed on scientific rigor and reproducibility.

• **Human Movement Sciences**
This domain focuses on the scientific study of human movement, integrating **biomechanics**, **sensorimotor control and learning**, **exercise physiology**, and **psychology of physical activity** to address research questions in sport, health, and performance.

• **Data Science for Research**
Students acquire advanced skills in **time-series analysis**, **dynamic systems modeling**, **data visualization**, and **artificial intelligence / machine learning**, with a strong focus on **reproducible research practices** and data-driven discovery.

Year 1 – Research Skills Development

During Year 1, students acquire the **foundations of scientific research** in movement and digital sciences. They develop skills in **experimental design, ethical research practices, quantitative analysis, and scientific programming**, while gaining hands-on experience through **in-lab training modules**. Students learn to **collect, process, model, and analyze multimodal data**, and to translate research questions into **reproducible, data-driven experimental protocols**, preparing them for advanced research projects and long-term research internships.

Year 2 – Advanced Research Skills and PhD Preparation

In Year 2, students deepen their expertise in **advanced data analysis, computational modeling, and artificial intelligence**, with a strong emphasis on **open science and reproducible research**. Through multidisciplinary team projects and extended research internships, students develop the ability to **design and conduct independent research**, integrate **complex multimodal datasets**, and apply **advanced statistical and machine learning methods** to human movement and health-related research questions, providing direct preparation for **doctoral studies and research-driven careers**.

DETAILED CURRICULUM

Year 1 (Master 1)

- Experimental Design and Ethics **(1 ECTS)**
- Mathematical Analysis **(1 ECTS)**
- Python, R and Git for data analysis **(2 ECTS)**
- Mechanical Principles, Kinematics, Kinetics, Muscle and Joint **(1 ECTS)**
- Neuroscicences of movement and learning **(1 ECTS)**
- Physiological Adaptations to exercise **(1 ECTS)**
- Exercise psychology, Emotions **(1 ECTS)**
- Modeling using dynamical systems **(1 ECTS)**
- Probablities and statistics **(1 ECTS)**
- Time series analysis **(1 ECTS)**
- Human and machine learning **(1 ECTS)**
- In Lab **(2 ECTS)**
- Transversal training **(4 ECTS)**
- Personal project **(10 ECTS)**
- Research internship **(30 ECTS)**

In-Lab training modules

- From Muscle Signals to Movement Control and Force Estimation
- From Motion Capture to Movement Analysis: From Lab to Field
- About causality in human behavior, ask 'how' rather than 'what'
- All about muscle oxygen during physical work
- Human Robot interaction

Year 2 (Master 2)

- Measurement and Analysis Chain for Biofeedback **(1 ECTS)**
- Multimodal data fusion and analysis **(1 ECTS)**
- Advanced statistics: Bayesian, Fuzzy, Multivariate, Probalities **(2 ECTS)**
- Open Science and Open data **(1 ECTS)**
- System plasticity and rehabilitation **(1 ECTS)**
- Optimal control of human movements **(1 ECTS)**
- Neuromechanics **(1 ECTS)**
- Brain and Behavior Connections **(1 ECTS)**
- Optimisation for machine learning **(1 ECTS)**
- Deep Learning and Recommander Systems **(1 ECTS)**
- Human Machine Interaction **(1 ECTS)**
- Graph analysis **(1 ECTS)**
- Reinforcement learning **(1 ECTS)**
- Non-Core **(2 ECTS)**
- Transversal units **(4 ECTS)**
- Multidisciplinary TEAM project **(10 ECTS)**
- Research internship **(30 ECTS)**

ADMISSION REQUIREMENTS & STUDENT PROFILE

Prerequisites and Ideal Applicant Profile

Academic Background

Applicants must hold a **Bachelor's degree (or equivalent)** in a **quantitative, scientific, or engineering-related discipline**, such as **Sports or Movement Sciences, Rehabilitation Sciences, Biomedical Sciences, Computer Science, Data Science, Applied Mathematics, Physics, Engineering**, or a closely related field. Candidates with strong quantitative skills and prior research exposure are particularly encouraged to apply.

Language Requirements

A **minimum English proficiency level of B2 (CEFR)** is required, as the program is fully taught in English.

Ideal Applicant Profile

The DigiMove program targets **high-achieving and highly motivated students** with a demonstrated interest in **research excellence**, **interdisciplinary science**, and **doctoral-level training**. Successful candidates typically show strong analytical abilities, intellectual curiosity, and a clear commitment to pursuing **research careers or PhD studies** in movement, health, and digital sciences.

Application Requirements

- **Curriculum Vitae (CV)** highlighting academic achievements, research experience, and technical skills
- **Motivation letter** outlining academic goals and research interests
- **Two letters of recommendation** from researchers and/or university professors familiar with the applicant's academic and research potential
- **Official academic transcript and class ranking**, demonstrating strong academic performance within the cohort

CAREER OPPORTUNITIES

Future Careers and Next Steps

The DigiMove Master's program is designed as a **launching point for advanced research and doctoral studies**. For many graduates, the **natural next step is a PhD** in **movement sciences, digital health, AI, biomechanics, or related interdisciplinary fields**, preparing them for careers in **academic and industrial research**.

Graduates are also equipped for high-level roles at the intersection of **AI, data science, and human movement**:

- **PhD Candidate / Researcher** in sport, health, or digital sciences
- **Data Analyst / Researcher** for embedded movement and physiological sensors
- **Connected Health Engineer** or researcher in digital health technologies
- **Digital Neuro-Rehabilitation Specialist** integrating AI and biomechanics
- **Rehabilitation Specialist** leveraging AI-enhanced virtual or augmented reality
- **Data Scientist** in sports organizations, health tech companies, or research institutes
- **AI Coach or Biomechanics Engineer** designing intelligent training and rehabilitation systems

This pathway allows graduates to **combine experimental research, data science, and human movement expertise**, positioning them for **leadership in cutting-edge research, innovation, and applied technology in sport and healthcare**.

RESEARCH LABORATORIES & ACADEMIC PARTNERS

Academic, Institutional, and Industry Partners

The DigiMove program is supported by a **strong network of academic laboratories, research institutions, and industry partners**, providing students with **hands-on research experience, collaborative projects, and real-world applications**:

Academic and Research Laboratories

- **EuroMov DHM** (University of Montpellier + **Institut Mines-Télécom, engineering school**) – Human movement sciences and digital technologies
- **LIRMM** (University of Montpellier + CNRS) – Computer science, AI, and robotics research
- **IES** (University of Montpellier + CNRS) – Biomechanics and human-environment interaction
- **PhyMedExp** (University of Montpellier + INSERM) – Experimental physiology and medical research

Medical and Healthcare Institutions

- **CHU Montpellier (Cartigen)** – Translational research in health and rehabilitation

Industry and Innovation Partners

- **Semaxone** – French startup collaborating with **EuroMov DHM**, developing **physiological sensor technologies and AI-based tools** for monitoring human performance and cognitive states, with applications in **sports, rehabilitation, and extreme environments**

This ecosystem allows students to **conduct cutting-edge research, collaborate with interdisciplinary teams, and access state-of-the-art facilities**, preparing them for **PhD studies and high-level research careers in movement sciences, digital health, and AI**.