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PROPOSAL TO HOST THE

11th IEA Digital Human Modelling (DHM) Symposium 2028

Digital Humans for an Intelligent, Inclusive and Sustainable World

Proposed Host: **Indian Institute of Technology Jammu, India**



Human-Centred Technologies | Inclusive Design & Society | Intelligent Manufacturing | Sustainability & Wellbeing

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DHM in the Global Context: Progress, Gaps and India's Opportunity

GLOBAL PROGRESS IN DHM

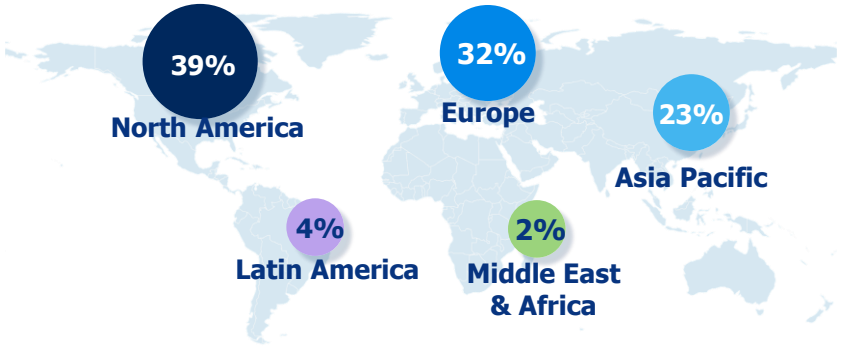
Rapid growth across research, technology and applications

3.6×
increase in DHM publications (2013–2023)

~USD 35 Billion
global market value (2023)

Expanding applications
Healthcare | Mobility | Manufacturing | Safety | Sports | Assistive devices | Virtual training

LEADING REGIONS IN DHM RESEARCH



Asia–Pacific is the fastest growing region, driven by healthcare, ageing populations and advanced manufacturing.

PERSISTENT GAPS AND CHALLENGES

Despite significant progress, key limitations remain:

Limited diversity
Most models developed on Western populations

Fragmented data
Lack of large, multimodal, population-specific datasets

Validation challenges
Limited real-world validation across age, gender, ethnicity and pathologies

Translation to practice
Slow adoption in industry and healthcare systems

Ethical and societal issues
Data privacy, bias, accessibility and responsible AI integration

INDIA'S UNIQUE OPPORTUNITY

A large, diverse population and a growing innovation ecosystem position India to make globally significant contributions to DHM.



Population scale and diversity
1.4+ billion people with unique anthropometry, ethnicity, lifestyles and health profiles.



High societal need
Ageing population, non-communicable diseases, disabilities and workplace safety challenges.



Strong academic and industrial base
Engineering, healthcare, materials, AI and manufacturing capabilities



Potential for frugal and inclusive innovation
Scalable, cost-effective solutions for India and the Global South

Positioning India as a global platform for inclusive, validated and application-driven digital human modelling

Why India? A Living Laboratory for Digital Human Modelling

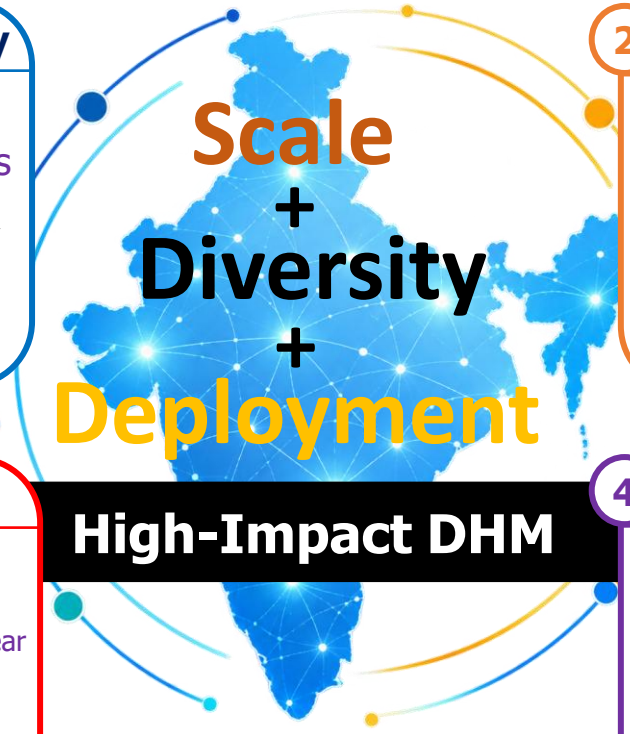
1 Population & Human Diversity

1.4B+ People

22 Scheduled Languages

Wide variation in anthropometry, climate, occupations and mobility patterns

A strong basis for inclusive, population-aware DHM



2 Mobility and Automotive

34.7 million vehicles produced in FY 2025-26

4.64 million passenger vehicles sold

21.7 million two-wheelers sold

Major DHM opportunities in occupant safety, rider ergonomics and human-machine interaction.

3 Healthcare & Rehabilitation

Ayushman Bharat PM-JAY

~55 Crore beneficiaries

₹5 lakh Health cover/eligible family/year

Growing ecosystem for rehabilitation, prosthetics, orthotics and digital health

High relevance for clinical and assistive DHM

4 Human-Centred Industry

Large-scale manufacturing, logistics and service-sector workplaces.

Stronger need for ergonomics, worker safety and biomechanical assessment

Growing opportunities in wearable sensing and human-robot collaboration

DHM can bridge design, productivity and wellbeing

India offers the scale to deploy DHM, the diversity to challenge its assumptions, and the industrial and healthcare ecosystems to translate it into measurable human-centred impact.

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India: A strategic Host for DHM 2028?

Industry momentum, national research reach and translational relevance

1 BCCI: A High-Performance Human-Science Anchor



- BCCI Centre of Excellence, Bengaluru integrates coaching, sports science, sports medicine, strength & conditioning and technology
- Strong relevance for injury prevention, rehabilitation, return-to-play and workload analytics
- Demonstrates India's elite-performance ecosystem as a natural DHM application domain

Sports science | Rehabilitation



2 International Biomechanics Technology is Entering India



- Qualisys AB (Sweden) opened its Delhi subsidiary in 2025
- India positioned as a long-term strategic investment and South Asia growth hub
- Strong fit with motion capture, gait analysis and life-sciences applications

2025 | Qualisys Delhi

3 Clinical & Demonstration Readiness



- Qualisys and Delsys participated in IRCOBI Asia 2025 at IIT Madras
- Workshop examples included 3D gait analysis, force plates and surface EMG
- India can support live demonstrations, tutorials and translational sessions for DHM 2028

MoCap | Force plate | sEMG

5 Why This Strengthens DHM 2028



- Connects DHM with sport, rehabilitation, biomechanics and human-performance tech
- Expands scope for invited industry speakers, tutorials and sponsor-backed demo tracks
- Broadens DHM impact beyond academia into clinics, industry and elite sport
- Positions India as a new growth node for the global DHM community

4 Four-Zone National Institute Network

North Zone
- IIT Delhi
- IIT Roorkee
- IIT Ropar

West Zone
- IIT Bombay
- IIT Gandhinagar
- IIT Jodhpur



East/Central Zone
- IIT Kharagpur
- IIT Patna
- IIT (BHU) Varanasi

South Zone
- IIT Madras
- IIT Hyderabad
- IISc Bengaluru

National reach for participation, tutorials and collaboration

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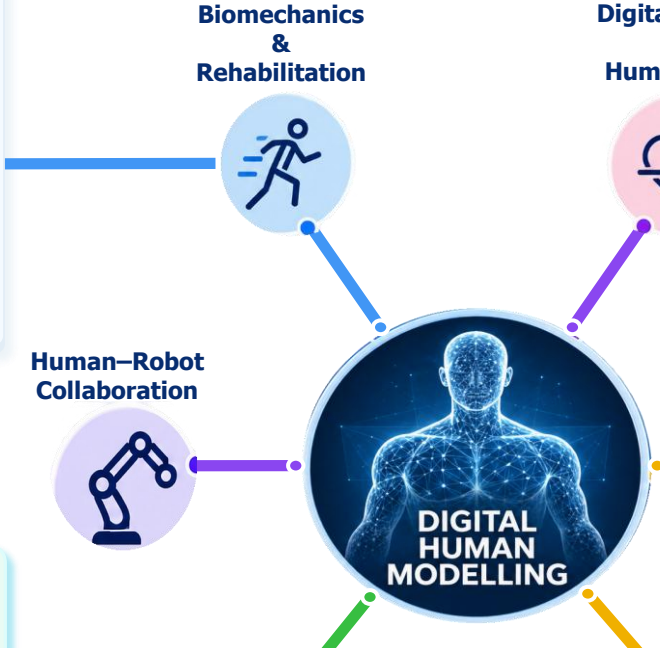
Why Jammu? A Convergent Knowledge Ecosystem for DHM

Engineering x Medicine x Life Sciences x Management —— with one regional innovation network



IIT JAMMU
Engineering & Technology

- Digital manufacturing
- AI/ML
- Robotics
- Materials
- Simulation
- Human-centred design



AIIMS JAMMU
Medicine & Clinical Sciences

- Clinical research
- Rehabilitation
- Patient-centred care
- Medical education
- Healthcare innovation



First AIIMS facility in the Union Territory of Jammu & Kashmir, inaugurated in 2024.



CSIR–IIIM JAMMU
Life Sciences & Translational Research

- Drug discovery
- Natural products
- Biotechnology
- Therapeutics
- Translational science

Traces its origins to 1941; focused on natural-products-based drug discovery and biotechnology-enabled therapeutics.

IIM JAMMU
Management & Human Systems

- Management science
- Operations
- Healthcare management
- Technology adoption
- Industry linkages



Established in 2016. Offers an MBA in Hospital Administration & Healthcare Management (jointly with AIIMS Jammu and IIT Jammu).

DHM Collaboration Pipeline

1 Clinical / Population Needs
Healthcare, rehabilitation, workplace and product design needs

2 Human Data Acquisition
Anthropometry, motion capture, imaging and clinical data

3 Digital Human Models
Geometric, biomechanical, physiological and behavioural models

4 Simulation & Decision Support
Virtual testing, scenario analysis and AI-driven insights

5 Translation to Impact
Improved healthcare, safer workplaces and better products

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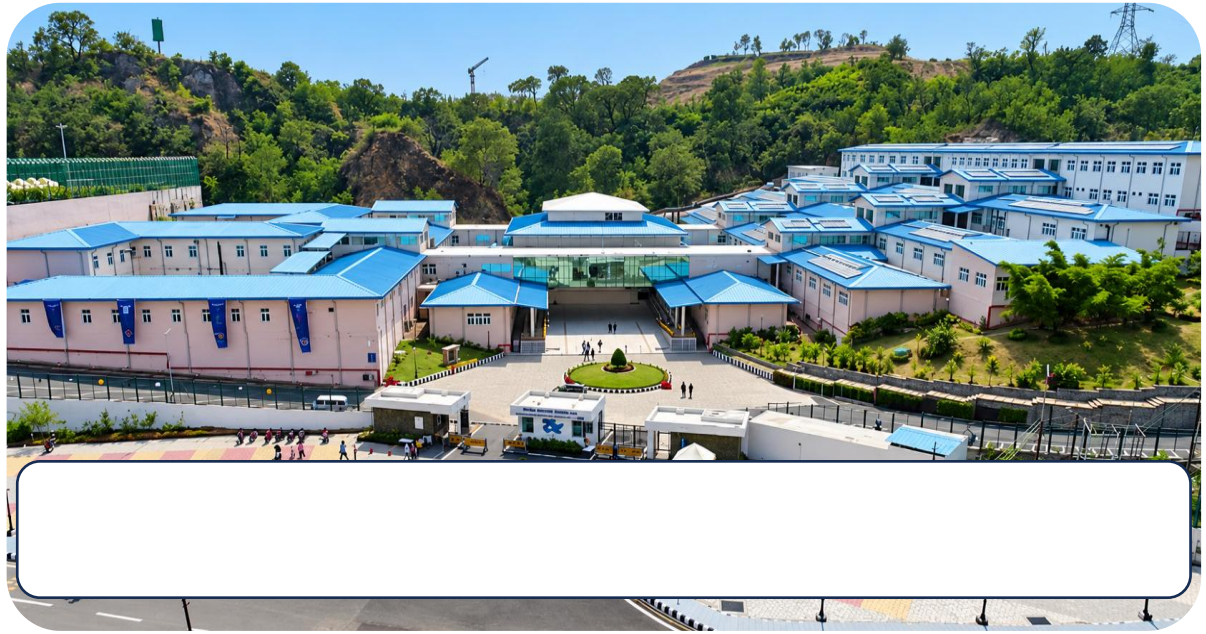
Why IIT Jammu? An Ideal Venue for DHM 2028

A Modern, accessible and inspiring environment for global collaboration



Strategic Location & Connectivity

Well connected to major Indian cities and international destinations



Jammu Airport
~12 km from campus
Direct flights to major Indian cities
International connectivity via Delhi

Jammu Tawi Railway Station
~20 km
Well connected to major cities

By Road
Excellent road connectivity
via National Highways (NH-44)

Campus Location
In the foothills of the Shivaliks
Serene, green and safe environment

State-of-the-Art Infrastructure

Modern facilities to host a world-class international event







Modern Seminar halls
High-capacity, well-equipped venues for plenary and technical sessions

Smart classrooms
Advanced AV systems and hybrid event capabilities

Research and innovation facilities
Interdisciplinary labs and centres

Comfortable accommodation
On-campus and nearby options for participants

Dining and recreational spaces
Cafeterias, sports facilities and scenic outdoor spaces

A Safe, Welcoming and Enriching Environment

Experience the perfect blend of academic excellence and natural beauty

Safe and hospitable city
Warm and welcoming community

Pleasant climate (Oct–Nov)
Ideal weather for travel and outdoor activities

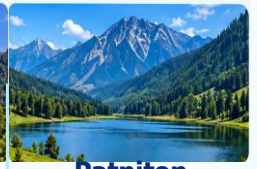
Rich cultural heritage
Proximity to historical and spiritual destinations

Unique natural surroundings
Himalayan landscapes, trekking routes and ecological diversity

Nearby Attractions

A rich blend of nature, culture and heritage


Vaishno Devi
~50 km


Patnitop
~112 km


Bahu Fort
~20 km


Scenic Himalayan
Nearby gateways

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Strength of Our Host Team

A research-led, internationally connected and implementation-ready team for DHM 2028

Research Excellence

- 13+ years of research experience
- 80+ technical publications | H-index 20 | 1371 citations
- Expertise spanning additive manufacturing, advanced materials and application-driven engineering

Competitive Project Leadership

- PI / Co-PI roles in ICMR, DST, DRDO, SERB and BIS funded projects
- Strong execution record in biomedical AM, prosthetics, dental and advanced manufacturing
- Demonstrated interdisciplinary project management

Global Academic Engagement

- Research and visiting appointments across New Zealand, Singapore, USA, Taiwan, Italy and France
- Established international academic collaborations and mobility

DHM 2028 HOST TEAM

Institutional Leadership

- Head, Mechanical Engineering
- Associate Dean, Skill Development & CES
- Programme, committee and academic coordination experience

Conference and Outreach Delivery

- Experience in workshops, research conclaves, seminar series and technical boot camps
- Strong capability in scientific programme curation and stakeholder engagement

Technical & Laboratory Ecosystem

- Capabilities in additive manufacturing, composites, CAD/FEA and materials characterisation
- SEM, mechanical testing, DSC, TGA and DMA
- Suitable for demonstrations, discussions and interdisciplinary engagement

Research depth | **Administrative leadership** | **Global collaborations** | **Event delivery** | **Technical readiness**

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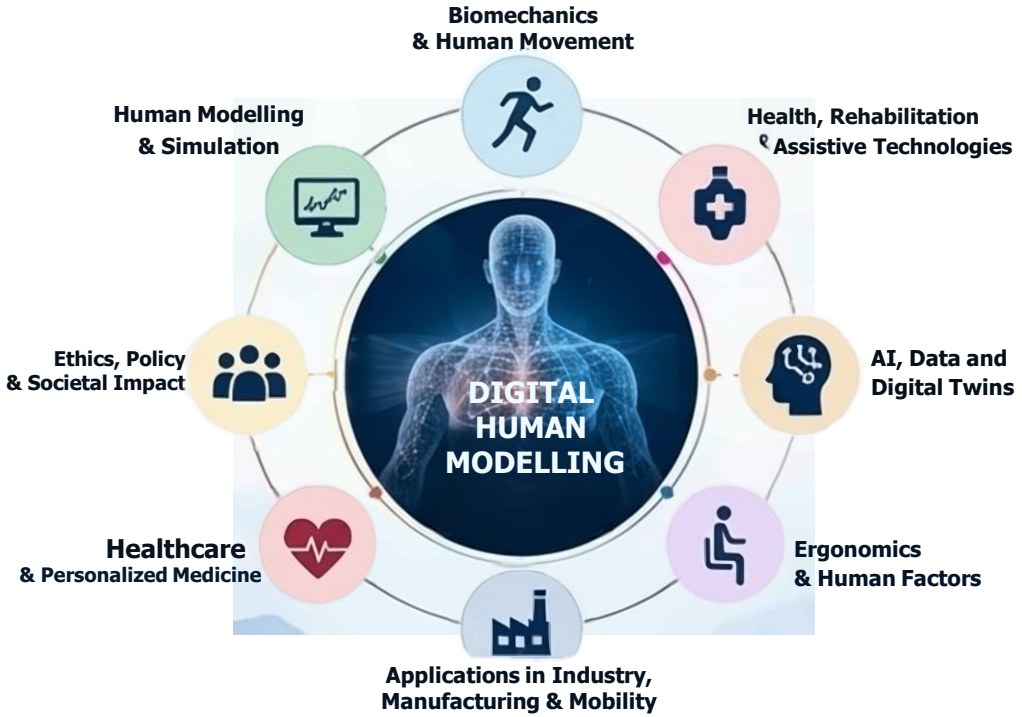
Symposium Objectives and Themes

Objectives

1. **Knowledge Exchange**
   Share latest research, methods and applications in DHM.
2. **Global Collaboration**
   Build interdisciplinary and international partnerships.
3. **Real-world Translation**
   Bridge research with industry, healthcare and policy.
4. **Societal Impact**
   Promote inclusive, sustainable and human-centred innovations.



Key Outcomes

Scientific Advancement
New methods, tools and validated models for DHM across domains.

Strategic Partnerships
Collaborative research and industry-academia linkages.

Innovation and Technology Transfer
Pathways for real-world implementation.

Roadmap for the Future
Recommendations for research, policy and capacity building in DHM.

THEMES COVERED

1. HUMAN MODELLING AND SIMULATION



Geometric, biomechanical, physiological and behavioural models

2. HEALTH, REHABILITATION AND ASSISTIVE TECHNOLOGIES



Prosthetics, orthotics, rehabilitation robotics and inclusive design

3. AI, DATA AND DIGITAL TWINS



AI/ML, human data acquisition, digital twins and predictive modelling

4. ERGONOMICS AND HUMAN FACTORS



Workplace ergonomics, safety and performance modelling

5. APPLICATIONS IN INDUSTRY, MANUFACTURING AND MOBILITY



Digital manufacturing, automotive, aerospace and smart mobility

6. ETHICS, POLICY AND SOCIETAL IMPACT



Human-centred innovation, inclusivity, sustainability and policy

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Programme Structure & Scientific Scope

Conference Format

A balanced mix of knowledge exchange, skill development and networking

Plenary Lectures
Global thought leaders

Technical Sessions
Oral & poster presentations

Workshops & Tutorials
Hands-on training

Industry Showcase
Emerging technologies

Networking & Collaboration
Academia, industry, policy

Scientific Tracks

Covering the full spectrum of Digital Human Modelling

01	Human Biology, Biomechanics and Physiology
02	Imaging, Data Acquisition and AI
03	Modelling, Simulation and Validation
04	Healthcare, Clinical Applications and Rehabilitation
05	Human-Technology Interaction (Robotics, XR, Wearables)
06	Human Factors, Behaviour and Diversity
07	Safety, Policy, Ethics and Society
08	Sustainability, Workplaces and Future of DHM

Target Participants

A truly international and multidisciplinary community

- Researchers and Academics
- Clinicians and Healthcare Professionals
- Engineers and Product Designers
- Industry and Technology Developers
- Policy Makers and Regulators
- Students and Early-Career Researchers

Tentative Programme Overview

A dynamic and engaging week at IIT Jammu

Day 0 (Sun)
Arrival & Registration
Welcome Reception

Day 1 (Mon)
Opening Ceremony & Plenary Lectures
Keynote talks Global perspectives on DHM

Day 1 (Mon)
Technical Sessions
Oral & poster presentations
Track sessions

Day 2 (Tue)
Workshops & Tutorials
Hands-on training and skill development

Day 2 (Tue)
Industry & Innovation
Industry showcase
Panel discussions
Technology demos

Day 3 (Wed)
Thematic Services
Policy, ethics and societal impact
Future directions

Day 3 (Wed)
Closing Ceremony
Key takeaways
Next steps
Cultural event

Expected Outcomes

From knowledge creation to real-world impact

- New scientific insights and validated models
- Strengthened academic-industry collaboration
- Capacity building and skill development
- Policy and societal recommendations for inclusive DHM
- Open datasets and shared resources (where possible)
- Pathways to sustainable, human-centred innovation