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National Defense & Investment Opportunities Report:

US Patent 11,577,177 ("Infinite Movement" Treadmill)

Based on Declaration of Hao Li (Case No. 3:17-cv-04006-JST)

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1. Key Document Reference

- **Declaration of Hao Li**:
  https://storage.courtlistener.com/recap/gov.uscourts.cand.314347/gov.uscourts.cand.314347.139.7.pdf
- **Relevance**:
  Highlights direct ties between the patent's core technology (virtual movement systems) and defense-funded research in human digitization, simulation, and immersive training.

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2. Defense Entity Alignment

- **U.S. Army & Army Research Office (ARO)**
  - **Existing Investments:**
    $2.8M for *"Avatar Digitization & Immersive Communication Using Deep Learning"* (ARO, 2017–2019).
    $1.4M for *"Capture, Rendering, & Display for Virtual Humans"* (ARO, 2016–2017).
  - **Interest in Patent**:
    The treadmill's ability to simulate unrestricted movement in confined spaces aligns with ARO's focus on **immersive soldier training**. The system could enable soldiers to "walk" through virtual combat zones, urban terrains, or disaster scenarios while physically stationary—critical for mission rehearsals in controlled environments.

- **Office of Naval Research (ONR)**
  - **Existing Investments**:
    $591K for *"Complete Human Digitization and Unconstrained Performance Capture"* (ONR Young Investigator Award, 2018–2021).
  - **Interest in Patent**:
    ONR's funding of unconstrained human digitization directly overlaps with the treadmill's capability to map real-world user motion to virtual avatars. Applications include naval VR training (e.g., shipboard firefighting simulations) and telepresence for remote operations.

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- **DARPA & Intelligence Advanced Research Projects Activity (IARPA)**
  - **Existing Investments**:
    $419K for *"GLAIVE: Graphics and Learning Aided Vision Engine for Janus"* (IARPA/DoD, 2014–2018).
  - **Interest in Patent**:
    DARPA's history of funding AI-driven virtual environments (e.g., *Squad X* program) suggests strong potential for integrating the treadmill into AI-generated "infinite" training worlds. The patent's real-time camera-treadmill syncing could enhance autonomous drone pilot training or mixed-reality battlefield simulations.

- **USC Institute for Creative Technologies (ICT)**
  - **Existing Partnerships**:
    Hao Li directs ICT's Vision and Graphics Lab, which has received $8.89M in federal grants (2015–2019) for projects like *"Light Stage Pipeline for High-Fidelity Face Digitization"* (ARO-funded).
  - **Interest in Patent**:
    ICT's work on soldier avatars and VR trauma training (e.g., *STRIVE* project) could leverage the treadmill to create hyper-realistic, physically interactive scenarios. The treadmill's compatibility with LED/green screens (as cited in the patent) matches ICT's existing virtual production infrastructure.

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3. Investment Opportunities

- **Military Training Contracts**
  - **Target**:
    U.S. Army's Synthetic Training Environment (STE) program, a $10B initiative to modernize VR/AR soldier training.
  - **Use Case**:
    Replace traditional treadmills in STE's One World Terrain system, enabling soldiers to traverse AI-generated global landscapes.

- **Defense Contractor Partnerships**
  - **Example**:
    Lockheed Martin or **Northrop Grumman**, which develop VR training modules for F-35 pilots and ground troops.
  - **Patent Value**:
    Treadmill's real-time haptic feedback (vibration cues for positional awareness) could enhance situational realism in simulations.
- **Dual-Use Commercialization**
  - **Path**:
    License the patent to defense-focused startups (e.g., Anduril Industries) for border security simulations or drone operator training.

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4. Strategic Recommendations

- **Leverage USC ICT's Defense Network**:
  Use Hao Li's existing ARO/ONR grants (declared in the court document) to pilot the treadmill in ongoing projects like *"Digital SHARP Survivor"* (ARO-funded trauma training).
- **Pursue SBIR/STTR Funding**:
  Target DARPA's Small Business Innovation Research program for AI-integrated locomotion systems.
- **Collaborate with Simulation Tech Firms**:
  Partner with CAE or Bohemia Interactive Simulations (military VR providers) to embed the treadmill into their platforms.

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5. Conclusion

- The Declaration of Hao Li underscores ***direct alignment between US Patent 11,577,177 and defense priorities in immersive training, human digitization, and AI-driven virtual environments.***
- With documented funding from ARO, ONR, and DARPA for related technologies, InfiniSet's treadmill is positioned to attract strategic partnerships and contracts within the national defense sector.

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6. Next Step

- Initiate outreach to USC ICT's military liaisons and submit proposals to DoD's Simulation and Training Technology Center (STTC).

Document Citation:

***Declaration of Hao Li**, pp. 18–21 (Research Grants), 27–30 (Defense Projects)*
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