

# Standardized Publication List

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## Contents

|   |    |
|---|----|
| 1. Workspace Analysis.....                                | 2  |
| 2. Vision .....   | 2  |
| 3. Validation .....                                       | 3  |
| 4. Thesis and Dissertations.....                          | 4  |
| 5. Thermal - Thermodynamics.....                          | 5  |
| 6. Survivability.....                                     | 6  |
| 7. Strength - Fatigue - Muscles .....                     | 6  |
| 8. Predictive Dynamics.....                               | 7  |
| 9. Posture - IK.....                                      | 8  |
| 10. Human Modeling.....                                   | 9  |
| 11. Physiology.....                                       | 10 |
| 12. Open Architecture-API-SDK.....                        | 10 |
| 13. Muscle Activation.....                                | 10 |
| 14. MotionCapture .....                                   | 11 |
| 15. Injury Prediction.....                                | 11 |
| 16. Whole-Body Vibration (WBV) Research.....              | 12 |
| 17. Human Performance – Dynamics physics based.....       | 13 |
| 18. Human Motion and Path Planning .....                  | 15 |
| 19. Human Modeling Overview.....                          | 16 |
| 20. Human Mass and inertia estimation: Anthropometry..... | 17 |
| 21. Human Load Stability and Balance.....                 | 17 |
| 22. Human Factors and Ergonomics .....                    | 19 |
| 23. Hand Modeling and Grasping.....                       | 20 |
| 24. Dual hand coordination .....                          | 21 |
| 25. Clothing and Fabric Modeling Research.....            | 22 |
| 26. Biomechanics Modeling.....                            | 22 |
| 27. Behavior Research .....                               | 23 |
| 28. AI- Enabled Human Modeling and Soldier Readiness..... | 23 |
| 29. Publications on Vibration and Biodynamics.....        | 24 |

## 1. Workspace Analysis

### 1. A general analytic approach for Santos upper extremity workspace

**Authors:** Jingzhou Yang, Tariq Sinokrot, Karim Abdel-Malek

**Citation / Document Type:** Computers & Industrial Engineering, 54 (2008) 242–258

### 2. Workspace zone differentiation and visualization for virtual humans

**Authors:** J. Yang, T. Sinokrot, K. Abdel-Malek, S. Beck, K. Nebel

**Citation / Document Type:** Ergonomics, 51:3 (2008) 395-413

### 3. Workspace boundaries of serial manipulators using manifold stratification

**Authors:** Karim Abdel-Malek, Jingzhou Yang

**Citation / Document Type:** The International Journal of Advanced Manufacturing Technology, 28 (2006) 1211–1229

### 4. Workspace Visualization and Analysis for Virtual Humans

**Authors:** Tariq Zeyad Abdel Hamed Sinokrot

**Citation / Document Type:** Master's Thesis, University of Iowa, 2005

### 5. Workspace Analysis and Visualization for Santos' Upper Extremity

**Authors:** Tariq Sinokrot, Jingzhou Yang, Rebecca Fetter, Karim Abdel-Malek

**Citation / Document Type:** SAE Technical Paper 2005-01-2739, 2005

### 6. Towards understanding the workspace of human limbs

**Authors:** Karim Abdel-Malek, Jingzhou Yang, Richard Brand, Emad Tanbour

**Citation / Document Type:** Ergonomics, 47:13 (2004) 1386-1405

### 7. Towards Understanding the Workspace of the Upper Extremities

**Authors:** Karim Abdel-Malek, Jingzhou Yang, Richard Brand, Emad Tanbour

**Citation / Document Type:** SAE Technical Paper 2001-01-2095, 2001

### 8. A mathematical method for ergonomic-based design: placement

**Authors:** Karim Abdel-Malek, Wei Yu, Jingzhou Yang, Kyle Nebel

**Citation / Document Type:** International Journal of Industrial Ergonomics, 34:5 (2004) 375-394

### 9. Layout Design using an Optimization-Based Human Energy Consumption Formulation

**Authors:** Joo H. Kim, Karim Abdel-Malek, Zan Mi, Kyle Nebel

**Citation / Document Type:** SAE Technical Paper 2004-01-2175, 2004

### 10. Development of a Zone Differentiation Tool for Visualization of Postural Comfort

**Authors:** Jingzhou Yang, Uday Verma, Rajeev Penmatsa, Timothy Marler, Steve Beck, Salam Rahmatalla, Karim Abdel-Malek, Chad Harrison

**Citation / Document Type:** SAE Technical Paper 2008-01-0772, 2008

### 11. On the Workspace of Human Limbs

**Authors:** K. Abdel-Malek, J. Yang, R. Brand, E. Tanbour

**Citation / Document Type:** Proceedings of the 2004 Digital Human Modeling for Design and Engineering Conference, 2004

## 2. Vision

### 1. Studying Visibility as a Constraint and as an Objective for Posture Prediction

**Authors:** Brian Lewis Smith, Tim Marler, and Karim Abdel-Malek

**Citation / Document Type:** SAE Technical Paper 2008-01-1875 (2008)

## **2. Vision Performance Measures for Optimization-Based Posture Prediction**

**Authors:** Timothy Marler, Kimberly Farrell, Joo Kim, Salam Rahmatalla, and Karim Abdel-Malek

**Citation / Document Type:** SAE Technical Paper 2006-01-2334 (2006)

## **3. Vision Study - Smith 2008**

**Authors:** Brian Lewis Smith, Tim Marler, and Karim Abdel-Malek

**Citation / Document Type:** 2008 Digital Human Modeling for Design and Engineering Conference (2008)

## **4. 06DHM-54 Vision Performance (1st Draft)**

**Authors:** Timothy Marler, Kimberly Farrell, Joo Kim, Salam Rahmatalla, and Karim Abdel-Malek

**Citation / Document Type:** VSR Technical Report / 1st Draft (2006)

## **5. 06DHM-54-FINAL**

**Authors:** Timothy Marler, Kimberly Farrell, Joo Kim, Salam Rahmatalla, and Karim Abdel-Malek

**Citation / Document Type:** Final Manuscript for SAE Technical Paper 2006-01-2334 (2006)

# **3. Validation**

## **1. A Validation Protocol for Predictive Human Locomotion**

**Authors:** Salam Rahmatalla, Yujiang Xiang, Rosalind Smith, Jinzheng Li, John Meusch, Rajan Bhatt, Colby Swan, Jasbir S. Arora, Karim Abdel-Malek

**Citation / Document Type:** International Journal of Vehicle Design, 2008

## **2. Validation of Santos Biomechanics**

**Authors:** Salam Rahmatalla, Yujiang Xiang, Rosalind Smith, John Meusch, Jinzheng Li, Rajankumar Bhatt, Karim Abdel-Malek

**Citation / Document Type:** Proceedings of the ASME 2009 Summer Bioengineering Conference, 2009

## **3. Validation of Jumping from a Box for the Virtual Human Model Santos™**

**Authors:** Steven Ewart, Jonathan DeShaw, John Michael, Salam Rahmatalla

**Citation / Document Type:** Technical Report, University of Iowa, 2009

## **4. Validation of Stand to Prone for the Virtual Human Model Santos™**

**Authors:** Salam Rahmatalla, Steven Ewart, John Michael, Madeline Tierney

**Citation / Document Type:** Technical Report, University of Iowa, 2008

## **5. Validation of Prone to Stand for the Virtual Human Model Santos™**

**Authors:** Salam Rahmatalla, Steven Ewart, John Michael, Madeline Tierney

**Citation / Document Type:** Technical Report, University of Iowa, 2008

## **6. Validation of Ladder Climbing for the Virtual Human Model Santos™**

**Authors:** Salam Rahmatalla, John Michael, Steven Ewart, Madeline Tierney, Jonathan DeShaw

**Citation / Document Type:** Technical Report, University of Iowa, 2008

## **7. Validation of Lower-Body Posture Prediction for the Virtual Human Model Santos™**

**Authors:** Salam Rahmatalla, Yujiang Xiang, Rosalind Smith, John Meusch, Jinzheng Li, Tim Marler, Brian Smith

**Citation / Document Type:** SAE Technical Paper 2009-01-2284, 2009

## **8. Validation of Vertical Jumping for the Virtual Human Model Santos™**

**Authors:** Salam Rahmatalla, Steven Ewart, John Michael, Jonathan DeShaw

**Citation / Document Type:** Technical Report, University of Iowa, 2009

## **9. Validation Methodology Development for Predicted Posture**

**Authors:** Timothy Marler, Jingzhou Yang, Salam Rahmatalla, Karim Abdel-Malek, Chad Harrison  
**Citation / Document Type:** Technical Report, University of Iowa, 2006

**10. Validation of Predicted Posture for the Virtual Human Santos™**

**Authors:** Jingzhou Yang, Salam Rahmatalla, Tim Marler, Karim Abdel-Malek, Chad Harrison  
**Citation / Document Type:** SAE Technical Paper 2005-01-2682, 2005

**11. A Validation Framework for Predictive Human Models**

**Authors:** Salam Rahmatalla, Yujiang Xiang, Rosalind Smith, John Meusch, Rajankumar Bhatt  
**Citation / Document Type:** Technical Report, University of Iowa, 2008

**12. Multiple User Defined End-Effectors with Shared Memory Communication for Posture Prediction**

**Authors:** Brent Rochambeau, Timothy Marler, Anith Mathai, Karim Abdel-Malek  
**Citation / Document Type:** SAE Technical Paper 2008-01-1922, 2008

**13. Modeling Ability to Perform Common Soldier Tasks Based on the Army Combat Fitness Test Deadlift**

**Authors:** Laura A. Frey-Law, Rajan Bhatt, Russell Schneider, Guillermo Laguna Mosqueda, Marco Tena Salais, Landon Evans, Karim Abdel-Malek  
**Citation / Document Type:** 7th International Digital Human Modeling Symposium (DHM 2022)

**14. Multi-objective optimization-based method for kinematic posture prediction: development and validation**

**Authors:** Jingzhou (James) Yang, Tim Marler, Salam Rahmatalla, Karim Abdel-Malek  
**Citation / Document Type:** International Journal of Vehicle Design, 45:1-2 (2007) 226-243

**15. Validation - Yang 2007.pdf**

**Authors:** Jingzhou Yang, Salam Rahmatalla, Tim Marler, Karim Abdel-Malek  
**Citation / Document Type:** 2007 Digital Human Modeling for Design and Engineering Conference, 2007

**16. Validation - Marler 2007.pdf**

**Authors:** Timothy Marler, Salam Rahmatalla, Jingzhou Yang, Karim Abdel-Malek  
**Citation / Document Type:** SAE Technical Paper 2007-01-2495, 2007

## 4. Thesis and Dissertations

**1. Optimization-Based Dynamic Human Motion Prediction**

**Authors:** Emily Nicole Horn  
**Citation / Document Type:** Master's Thesis, University of Iowa, 2009

**2. Workspace Visualization and Analysis for Virtual Humans**

**Authors:** Tariq Zeyad Abdel Hamed Sinokrot  
**Citation / Document Type:** Master's Thesis, University of Iowa, 2005

**3. Dynamics and Motion Planning of Redundant Manipulators Using Optimization, with Applications to Human Motion**

**Authors:** Joo Hyun Kim  
**Citation / Document Type:** Doctoral Dissertation, University of Iowa, 2006

**4. A Geodesics-Based Model for Collision Avoidance Path Prediction**

**Authors:** Jason Charles Olmstead Muhs  
**Citation / Document Type:** Master's Thesis, University of Iowa, 2005

**5. A Study of Alternative Formulations for Optimization of Structural and Mechanical Systems Subjected to Static and Dynamic Loads**

**Authors:** Qian Wang

**Citation / Document Type:** Doctoral Dissertation, University of Iowa, 2004

**6. Design, Actuation, and Control of a Complex Hand Mechanism**

**Authors:** Jason Dean Potratz

**Citation / Document Type:** Master's Thesis, University of Iowa, 2003

**7. A Mathematical and Computational Multiscale Clothing Modeling Framework**

**Authors:** Xiaolin Man

**Citation / Document Type:** Doctoral Dissertation, University of Iowa, 2006

**8. Virtual Human Hand: Grasping Strategy and Simulation**

**Authors:** Esteban Peña Pitarch

**Citation / Document Type:** Doctoral Dissertation, Polytechnic University of Catalonia, 2007

**9. Towards Physiological Modeling in Virtual Humans**

**Authors:** Anith Jacob Mathai

**Citation / Document Type:** Master's Thesis, University of Iowa, 2005

**10. Muscle Force and Activation Prediction for the Shoulder Girdle and Upper Extremity**

**Authors:** Amos Patrick

**Citation / Document Type:** Doctoral Dissertation, University of Iowa, 2005

**11. Digital Human Modeling Capabilities for Task-Based Survivability**

**Authors:** Jacob Todd Kersten

**Citation / Document Type:** Master's Thesis, University of Iowa, 2011

**12. Digital Human Modeling for Optimal Body Armor Design**

**Authors:** Nic Andrew Capdevila

**Citation / Document Type:** Master's Thesis, University of Iowa, 2011

## 5. Thermal - Thermodynamics

**1. Transient thermal model of the human body-synopsis.pdf**

**Authors:** Anith Mathai (Compiled under Karim A. Malek)

**Citation / Document Type:** University of Iowa Technical Report (2009)

**2. Substrate Depletion\_final.pdf**

**Authors:** Samantha Wagner, Anith Mathai (under Karim A. Malek)

**Citation / Document Type:** VSR Research Presentation (2014)

**3. Energy Adjustment in ETOWL.pdf**

**Authors:** Karim A. Malek

**Citation / Document Type:** GruntSim / VSR Technical Document

**4. Physiology in Santos-Writeup\_updated.pdf**

**Authors:** Karim A. Malek

**Citation / Document Type:** VSR Program Technical Writeup

**5. Critical Power Model.pdf**

**Authors:** Karim A. Malek

**Citation / Document Type:** VSR Physiology Modelin

## 6. Survivability

### 1. iHuman SANTOS- General List of capabilities-1 April 2024

**Authors:** Karim A. Malek

**Citation / Document Type:** Technical Specification

### 2. Santos survivability mobility and PPE

**Authors:** Karim A. Malek

**Citation / Document Type:** VSR Research Presentation

### 3. Task-Based Survivability Analysis and Injury Reduction

**Authors:** Karim A. Malek

**Citation / Document Type:** VSR Technical Report

### 4. Why SANTOS the Human Digital Twin? 1 April 2024

**Authors:** Karim A. Malek

**Citation / Document Type:** Technical Write-up

### 5. Santos the Virtual Soldier: Predicting Human Behavior

**Authors:** Karim A. Malek, Rajan Bhatt, et al.

**Citation / Document Type:** DHM and Posturography (2019)

### 6. ONR Head and Neck Final Report

**Authors:** Karim A. Malek

**Citation / Document Type:** Final Project Report to ONR

### 7. Clients and Applications - Santos Tech

**Authors:** Karim A. Malek

**Citation / Document Type:** VSR Applications Overview

### 8. Survivability-PPE-Armor

**Authors:** Karim A. Malek

**Citation / Document Type:** Folder/Placeholder Document

### 9. Digital Human Modeling Capabilities for Task-Based Survivability

**Authors:** Jacob Todd Kersten

**Citation / Document Type:** Master's Thesis

## 7. Strength - Fatigue - Muscles

### 1. Human Fatigue Modeling for Digital Humans

**Authors:** Anith Mathai, Tim Marler, and Karim Abdel-Malek

**Citation / Document Type:** SAE Technical Paper 2004-01-2144 (2004)

### 2. A New Approach to Modeling Muscle Fatigue in Digital Humans

**Authors:** Joo H. Kim, Jingzhou Yang, and Karim Abdel-Malek

**Citation / Document Type:** SAE Technical Paper 2004-01-2140 (2004)

### 3. Towards Physiological Modeling in Virtual Humans

**Authors:** Anith Jacob Mathai

**Citation / Document Type:** Master's Thesis, The University of Iowa (2005)

### 4. Knee and Elbow 3D Strength Surfaces: Peak Torque-Angle-Velocity Relationships

**Authors:** Laura A. Frey-Law, Andrea Laake, Keith G. Avin, Jesse Heitsman, Tim Marler, and Karim Abdel-Malek

**Citation / Document Type:** Journal of Applied Biomechanics, 28(6), 726-737 (2012)

## **5. Integrating Musculoskeletal Modeling with Optimization-Based Posture Prediction**

**Authors:** Amos Patrick and Karim Abdel-Malek

**Citation / Document Type:** SAE Technical Paper 2006-01-2357 (2006)

## **6. Empirical Strength Models for the Santos Virtual Human**

**Authors:** Laura A. Frey-Law and Keith G. Avin

**Citation / Document Type:** VSR Research Summary Report (2010)

## **7. A New Approach to Modeling Human Strength for Digital Humans**

**Authors:** Jingzhou Yang, Joo H. Kim, Karim Abdel-Malek, Tim Marler, and Jasbir Arora

**Citation / Document Type:** 2004 Digital Human Modeling for Design and Engineering Conference (2004)

## **8. Muscle Force and Activation Prediction for the Shoulder Girdle and Upper Extremity**

**Authors:** Amos Patrick

**Citation / Document Type:** PhD Dissertation, The University of Iowa (2005)

## **9. Predicting Strength for the Santos Virtual Soldier**

**Authors:** Laura A. Frey-Law

**Citation / Document Type:** VSR Technical Briefing (2008)

## **10. Biomechanical Strength Assessment of the Upper Extremity**

**Authors:** Karim Abdel-Malek, Jasbir Arora, and Tim Marler

**Citation / Document Type:** VSR Research Publication (2007)

## **8. Predictive Dynamics**

### **1. Predictive dynamics: an optimization-based novel approach for human motion simulation**

**Authors:** Y. Xiang, H.J. Chung, J.H. Kim, R. Bhatt, S. Rahmatalla, J. Yang, T. Marler, J.S. Arora, K. Abdel-Malek

**Citation / Document Type:** Structural and Multidisciplinary Optimization (2010)

### **2. Optimization-based dynamic human walking prediction: one step formulation**

**Authors:** Y. Xiang, J.S. Arora, S. Rahmatalla, K. Abdel-Malek

**Citation / Document Type:** International Journal for Numerical Methods in Engineering (2009)

### **3. Optimization-based motion prediction of mechanical systems: sensitivity analysis**

**Authors:** Y. Xiang, J.S. Arora, K. Abdel-Malek

**Citation / Document Type:** Structural and Multidisciplinary Optimization (2009)

### **4. Dynamic motion planning of 3D human locomotion using gradient-based optimization**

**Authors:** J.H. Kim, Q. Wang, S. Rahmatalla, C.C. Swan, J.S. Arora, K. Abdel-Malek

**Citation / Document Type:** Journal of Biomechanical Engineering (2008)

### **5. Alternative formulations for optimization-based human gait planning**

**Authors:** Q. Wang, Y. Xiang, J.S. Arora, K. Abdel-Malek

**Citation / Document Type:** 48th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference (2007)

### **6. Optimization-based human motion prediction and validation**

**Authors:** Y. Xiang, J.S. Arora, K. Abdel-Malek

**Citation / Document Type:** SAE Technical Paper 2007-01-2494 (2007)

### **7. A general approach to the predictive dynamics of human motion**

**Authors:** J.S. Arora, K. Abdel-Malek, J. Yang, T. Marler, J.H. Kim, R. Bhatt

**Citation / Document Type:** Digital Human Modeling for Design and Engineering Conference (2005)

## **8. Human Motion Simulation (Book Chapter 3: Posture Prediction and Optimization)**

**Authors:** K. Abdel-Malek

**Citation / Document Type:** Human Motion Simulation, Elsevier (2013)

## **9. Predictive dynamics for human motion simulation: A review**

**Authors:** K. Abdel-Malek, J.S. Arora

**Citation / Document Type:** VSR Technical White Paper / Manuscript

## **10. Sensitivity analysis for human motion prediction**

**Authors:** Y. Xiang, J.S. Arora, K. Abdel-Malek

**Citation / Document Type:** VSR Research Report (2008)

## **11. Predictive Dynamics: Throwing Motion**

**Authors:** K. Abdel-Malek, et al.

**Citation / Document Type:** VSR Technical Briefing

## **12. Predictive Dynamics: Running and Jumping**

**Authors:** Y. Xiang, R. Bhatt, S. Rahmatalla

**Citation / Document Type:** VSR Research Presentation

## **13. Human motion prediction with different performance measures**

**Authors:** Y. Xiang, J.S. Arora, K. Abdel-Malek

**Citation / Document Type:** Journal of Biomechanics (2010)

## **14. Human motion simulation: from kinematics to dynamics**

**Authors:** K. Abdel-Malek, J.S. Arora

**Citation / Document Type:** VSR Program Overview

## **15. Dynamic human motion prediction using a high-fidelity model**

**Authors:** J.H. Kim, K. Abdel-Malek

**Citation / Document Type:** VSR Manuscript

## **16. Fast calculation of human joint torques for predictive dynamics**

**Authors:** R. Bhatt, K. Abdel-Malek

**Citation / Document Type:** VSR Technical Report

## **17. Comparison of skeletal models for predictive dynamics**

**Authors:** S. Rahmatalla, K. Abdel-Malek

**Citation / Document Type:** VSR Internal Study

## **18. Predictive dynamics: Ladder Climbing**

**Authors:** J. Michael, S. Ewart, K. Abdel-Malek

**Citation / Document Type:** VSR Validation Report

## **9. Posture - IK**

### **1. Multiple User Defined End-Effectors with Shared Memory Communication for Posture Prediction**

**Authors:** Brent Rochambeau, Timothy Marler, Anith Mathai, and Karim Abdel-Malek

**Citation / Document Type:** SAE Technical Paper 2008-01-1922 (2008)

### **2. Study of Bi-Criterion Upper Body Posture Prediction Using Pareto Optimal Sets**

**Authors:** R. Timothy Marler, Jingzhou Yang, Jasbir S. Arora, and Karim Abdel-Malek

**Citation / Document Type:** IASTED International Conference on Applied Simulation and Modeling (2005)

### **3. Multi-objective optimization-based method for kinematic posture prediction: development and validation**

**Authors:** Jingzhou (James) Yang, Tim Marler, and Salam Rahmatalla

**Citation / Document Type:** Robotica, Vol. 29, pp. 245–253 (2011)

### **4. Real-Time Optimal Reach-Posture Prediction in a New Interactive Virtual Environment**

**Authors:** Jingzhou Yang, R. Timothy Marler, Steven Beck, Karim Abdel-Malek, and Joo Kim

**Citation / Document Type:** Journal of Computer Science & Technology, Vol. 21, No. 2, pp. 189-198 (2006)

### **5. Modeling Dual-Arm Coordination for Posture: An Optimization-Based Approach**

**Authors:** Kimberly Farrell, Timothy Marler, and Karim Abdel-Malek

**Citation / Document Type:** SAE Technical Paper 2005-01-2686 (2005)

### **6. Multi-objective Optimization for Upper Body Posture Prediction**

**Authors:** Jingzhou Yang, R. Timothy Marler, HyungJoo Kim, Jasbir S. Arora, and Karim Abdel-Malek

**Citation / Document Type:** AIAA 45th Structures, Structural Dynamics, and Materials Conference (2004)

### **7. A New Discomfort Function for Optimization-Based Posture Prediction**

**Authors:** Timothy Marler, Salam Rahmatalla, Meagan Shanahan, and Karim Abdel-Malek

**Citation / Document Type:** SAE Technical Paper 2005-01-2680 (2005)

### **8. A general analytic approach for Santos™ upper extremity workspace**

**Authors:** Jingzhou Yang, Tariq Sinokrot, and Karim Abdel-Malek

**Citation / Document Type:** Computers & Industrial Engineering, 54, pp. 242–258 (2008)

### **9. Posture prediction and physics-based human motion simulation**

**Authors:** —

**Citation / Document Type:** —

### **10. R Bhatt, K Farrell, K Abdel-Malek, J Arora, C Murphy**

**Authors:** —

**Citation / Document Type:** —

### **11. DHM and Posturography, 425-440**

**Authors:** —

**Citation / Document Type:** —

## **10. Human Modeling**

### **1. A Geodesics-Based Model for Collision Avoidance Path Prediction**

**Authors:** Jason Charles Olmstead Muhs

**Citation / Document Type:** Master's Thesis, The University of Iowa (July 2005)

### **2. Neural network for dynamic human motion prediction**

**Authors:** Mohammad Bataineh, Timothy Marler, Karim Abdel-Malek, and Jasbir Arora

**Citation / Document Type:** Expert Systems With Applications, 48, pp. 26–34 (2016)

### **3. A Fuzzy Synthesis Control Scheme and Optimization for Vehicle Dynamic Stability System**

**Authors:** Yunqing Zhang, Si Gao, Lingyang Li, Liping Chen, Jingzhou Yang, and Karim Abdel-Malek

**Citation / Document Type:** Proceedings of the ASME 2007 IDETC/CIE Conference, DETC2007-34518

### **4. Editorial: Human modeling and applications special issue**

**Authors:** Karim Abdel-Malek

**Citation / Document Type:** Computer-Aided Design, 39, p. 539 (2007)

## 11. Physiology

### 1. Physiology - example 2.pdf

**Authors:** Karim A. Malek

**Citation / Document Type:** Virtual Soldier Research (VSR) Program Presentation (2/28/2024)

### 2. DHM 2016 - Female Extended Load Carriage 14 April 2016.pdf

**Authors:** R. Bhatt, J. Arora, K. Abdel-Malek, et al.

**Citation / Document Type:** Proceedings of the International Digital Human Modeling Symposium (DHM 2016)

### 3. Physiology - Mathai 2005.pdf

**Authors:** Anith Jacob Mathai

**Citation / Document Type:** Master's Thesis, The University of Iowa (May 2005)

### 4. Physiology - additional technical report

**Authors:** Karim A. Malek

**Citation / Document Type:** VSR Internal Technical Report

## 12. Open Architecture-API-SDK

### 1. Santos API and Development Guide

**Authors:** Andy Taylor (Lead), Corey Goodman, Meenal Kahandelwal

**Citation / Document Type:** Virtual Soldier Research Technical Manual, Version 1.6 (2013)

### 2. OpenArchitecture\_07-18-2018.pdf

**Authors:** Karim A. Malek

**Citation / Document Type:** VSR Program Technical Presentation (2018)

### 3. Santos API and Development Guide (v1.5 Archive)

**Authors:** Andy Taylor

**Citation / Document Type:** VSR Internal Documentation (2012)

### 4. SDK Plugin Templates

**Authors:** Virtual Soldier Research Team

**Citation / Document Type:** VSR Software Development Kit (Code Samples)

### 5. Santos Platform & Open Architecture

**Authors:** Karim A. Malek

**Citation / Document Type:** Technical Overview White Paper

## 13. Muscle Activation

### 1. Muscle force and activation - Amos Patrick MS Thesis 2005.pdf

**Authors:** Amos Patrick

**Citation / Document Type:** Master's Thesis, The University of Iowa (May 2005)

### 2. A High Fidelity 3D Musculoskeletal Model of the Upper Arm for Real Time Interaction

**Authors:** Amos Patrick and Karim Abdel-Malek

**Citation / Document Type:** SAE Technical Paper 2005-01-2681 (2005) (File: SAE2006.pdf)

### 3. NURBS-Based Galerkin Method and Application to Skeletal Muscle Modeling

**Authors:** Xianlian Zhou and Jia Lu

**Citation / Document Type:** Muscle-SPM2005-final.doc / VSR Technical Paper (2005)

#### **4. Muscle Wrapping and Modeling John Looft Thesis.pdf**

**Authors:** John M. Looft

**Citation / Document Type:** VSR Research Presentation / Thesis Overview (under Karim A. Malek)

### **14. MotionCapture**

#### **1. SANTOS -EKTIMO- List of capabilities.pdf**

**Authors:** Karim A. Malek

**Citation / Document Type:** iHuman Technology / VSR Technical Specification

#### **2. Improved motion capture processing for high-fidelity human models using optimization-based prediction of posture and anthropometry.pdf**

**Authors:** Anna Seydel, Kimberly Farrell, Ross Johnson, Timothy Marler, Salam Rahmatalla, Rajan Bhatt, and Karim Abdel-Malek

**Citation / Document Type:** Advances in Human Factors in Simulation and Modeling, pp. 549–561 (2018)

### **15. Injury Prediction**

#### **1. Digital human method and simulation for predicting musculoskeletal injuries.pdf**

**Authors:** K. Abdel-Malek, J. Arora, R. Bhatt, S. Sultan, K. Farrell, L. Evans, K. Kregel, and T. Marler

**Citation / Document Type:** Virtual Soldier Research Program, University of Iowa

#### **2. Repetitive-Task Ankle Joint Injury Assessment Using Artificial Neural Network.pdf**

**Authors:** Sultan Sultan, Karim Abdel-Malek, Jasbir Arora, and Rajan Bhatt

**Citation / Document Type:** Advances in Human Factors in Simulation and Modeling, AHFE 2018

#### **3. Human Simulation System for Injury Assessment Due to Repetitive Loading.pdf**

**Authors:** Sultan Sultan, Karim Abdel-Malek, Jasbir Arora, and Rajan Bhatt

**Citation / Document Type:** Advances in Human Factors in Simulation and Modeling, AHFE 2017

#### **4. iHuman malum injury prediction.pdf**

**Authors:** Karim A. Malek

**Citation / Document Type:** Malum Terminus Technologies Inc. Technical Presentation

#### **5. Digital human modeling for injury prevention.pdf**

**Authors:** Rajan Bhatt, Tim Marler, Jasbir Arora, and Karim Abdel-Malek

**Citation / Document Type:** Virtual Soldier Research (VSR) Program White Paper

#### **6. RepetitiveLoadingInjuryPrediction\_Sultan\_AHFE2017.pdf**

**Authors:** Sultan Sultan, Karim Abdel-Malek, et al.

**Citation / Document Type:** AHFE 2017 Conference Proceedings

#### **7. S Sultan, K Abdel-Malek, J Arora, R Bhatt**

**Authors:** —

**Citation / Document Type:** —

#### **8. Repetitive-Task Ankle Joint Injury Assessment Using Artificial Neural Network**

**Authors:** —

**Citation / Document Type:** —

#### **9. International Conference on Applied Human Factors and Ergonomics, 423-432**

**Authors:** —

**Citation / Document Type:** —

## 16. Whole-Body Vibration (WBV) Research

### 1. A Framework to Study Human Response to Whole Body Vibration

**Authors:** Salam Rahmatalla, Ting Xia, James Ankrum, David Wilder, Laura Frey Law, Karim Abdel-Malek, Michael Contratto, Greg Kopp

**Citation / Document Type:** SAE Technical Paper 2007-01-2474 (2007)

### 2. Predictive Discomfort in Single- and Combined-Axis Whole-Body Vibration Considering Different Seated Postures

**Authors:** Jonathan DeShaw, Salam Rahmatalla

**Citation / Document Type:** Human Factors, Vol. 56, No. 5, pp. 850–863 (2014)

### 3. Human head–neck models in whole-body vibration: Effect of posture

**Authors:** Yang Wang, Salam Rahmatalla

**Citation / Document Type:** Journal of Biomechanics 46, pp. 702–710 (2013)

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**Authors:** Salam Rahmatalla, Ting Xia, Michael Contratto, Greg Kopp, David Wilder, Laura Frey Law, James Ankrum

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**Authors:** Karim Abdel-Malek, et al.

**Citation / Document Type:** SAE Technical Paper 2007-01-2494 (2007)

### 4. Optimization-based dynamic human walking prediction

**Authors:** Yujiang Xiang, et al.

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## **5. Dynamic motion planning of 3D human locomotion**

**Authors:** Joo H. Kim, et al.

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## **6. New Validation Protocol for Predicted Posture**

**Authors:** T. Marler, et al.

**Citation / Document Type:** Digital Human Modeling for Design and Engineering Conference (2007)

## **7. SANTOS: A Physics-Based Digital Human Simulation Environment**

**Authors:** Karim Abdel-Malek, et al.

**Citation / Document Type:** Proceedings of the Human Factors and Ergonomics Society (2006)

## **8. Multi-objective optimization-based method for kinematic posture prediction**

**Authors:** Jingzhou Yang, et al.

**Citation / Document Type:** Robotica, Vol. 29, pp. 245–253 (2011)

## **9. Modeling Dual-Arm Coordination for Posture: An Optimization-Based Approach**

**Authors:** Kimberly Farrell, et al.

**Citation / Document Type:** SAE Technical Paper 2005-01-2686 (2005)

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**Authors:** T. Marler, et al.

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## **11. Optimization-Based Human Energy Consumption Formulation**

**Authors:** J.H. Kim, et al.

**Citation / Document Type:** SAE Technical Paper 2004-01-2175 (2004)

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**Authors:** Jingzhou Yang, et al.

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## **13. Physiological responses to workload**

**Authors:** Anith J. Mathai

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## **27. Behavior Research**

### **1. SANTOS Digital Human Twin: Inducing Behavior (Presentation)**

**Authors:** Rajan Bhatt, Chris Murphy, and Karim Malek

**Citation / Document Type:** Abdel-Malek K, et al., Posture prediction versus inverse kinematics Proceedings of the Asme Design Engineering Technical Conference. 2: 37-45.

### **2. Santos the Virtual Soldier Predicts Human Behavior**

**Authors:** Karim Abdel-Malek, Rajan Bhatt, Kevin Kregel, Chris Murphy, Jack Rummells, Marco Tenasalais, Kaylee Lichtenstein, and Travis Klopfenstein

**Citation / Document Type:** Abdel-Malek, Karim, and Jasbir Singh Arora. Human Motion Simulation: Predictive Dynamics. Academic Press, 2013.

## **28. AI- Enabled Human Modeling and Soldier Readiness**

### **1. Enhancing Soldier Readiness: Biomechanical Evaluation of the US Army Combat Fitness Test Using Santos Digital Human Modeling**

**Authors:** K Abdel-Malek, R Bhatt, LF Law, C Murhphy, B Mohammad

**Citation / Document Type:** International Conference on Digital Human Modeling, 152–164

## **2. Modeling ability to perform common soldier tasks based on the Army Combat Fitness Test dead lift**

**Authors:** LA Frey-Law, R Bhatt, R Schneider, GL Mosqueda, MT Salais, L Evans

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## **3. Santos the virtual soldier predicts human behavior**

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## **29. Publications on Vibration and Biodynamics**

- **Wang, Y., & Rahmatalla, S.** (2013). "Human head-neck models in whole-body vibration: Effect of posture." *Journal of Biomechanics*, 46(4), 702-710.
- **Rahmatalla, S., & DeShaw, J.** (2011). "Predictive dynamics in virtual human simulation: Response to whole-body vibration." *International Journal of Vehicle Design*, 57(2-3), 133-151.
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- **Rahmatalla, S.** (2021). *Prehospital Transport and Whole-Body Vibration*. Springer Nature. (This work synthesizes years of research on random vibration effects on patients during transport).

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