Brian Weinberg

COO Safety First Arms, Inc. / CEO Enclave Technologies Inc.

brian@safetyfirstarms.com

Summary

Safety First Arms, Inc. is launching a new class of home defense guns that prevent unauthorized firing and guard against unauthorized handling and theft. Safety First Arms' firearms integrate several patented technologies that allow the owner access without adding the life threatening risks that an accessible loaded firearm presents to children and teens.

Enclave Technologies Inc. is a product research and development company specializing in the use of rapid technologies. We offer printing and prototyping services using our 3D Systems Projet 3500 HDmax. Additional services include contract research and development, product development, rapid prototyping, mechanical design, and more.

Experience

COO, Co-founder at Safety First Arms, Inc.
April 2013 - Present (3 years 10 months)
Introducing the Smart 2(TM) and Smart AR (TM) secure user-authorized firearms.

CEO / CTO at Enclave Technologies Inc.
January 2011 - Present (6 years 1 month)
Contract Engineering Research and Development, Product Development

Research And Development Engineer at Toolbox Medical Innovations
March 2014 - Present (2 years 11 months)
Toolbox Medical Innovations is a medical and diagnostics device development firm specializing in design-for-manufacturing and clinical research. We're able to take your design from concept to manufacturing to clinical trials to successful product launch. Our unique versatility allows us to provide turnkey product development, assist with design refinement, and work on a consulting basis. We offer a wide range of services from both our internal team, as well as a vast network of our collaborators, to ensure that you get the specific expertise and focus the market demands. Whatever the route, success is always our target.

Research and Development Engineer/Consultant at Symbient Product Development
September 2010 - March 2011 (7 months)

Senior Research Engineer at Biomedical Mechatronics Lab, Northeastern University
January 2004 - June 2010 (6 years 6 months)

Education

Northeastern University

MS, Mechanical Engineering, 2004 - 2007

Rutgers University

B.S., Mechanical Engineering, 2000 - 2003

Grade: with Highest Honors

Activities and Societies: Space Grant, Rapid Prototyping, Mechanical Design, Fluids, 3d systems Vipers2 in Lab

Interests

Father of 2, Entrepreneur, Inventor, Engineer, and classic cars

(https://www.youtube.com/watch?v=eJMxgE4uitE)

Patents

Gear stabilization techniques

eu Patent Application WO2015188187A1

Inventors: Brian Weinberg, Elias Brassitos, Dinos Mavroidis

This technology is part of a commercialization effort for Gear Bearing Drive technology. http://www.nsf.gov/awardsearch/showAward?AWD_ID=1343434 . Technology Translation - The Gear Bearing Drive: A Novel Compact Actuator for Robotic Joints

A balanced planetary gearbox including an assembly having an input stage and an output stage. The assembly includes two grounds, each with ground rollers and ground rings. The two grounds are fixedly attached to one another. The assembly includes a sun gear and planet sub-assemblies between the two grounds. The planet sub-assemblies include at least one input planet gear and one output planet gear. The sun gear and the input planet gears include rollers. An abutment of rollers in the gearbox keeps the sun gear and the planet gears in alignment. The output gear meshes with an output ring disposed in between the two ground rings, such that a combination of the at least one input planet gears from each of the plurality of planet sub-assemblies provides a structural symmetry to the planetary gearbox.

Systems and Methods of Using a Hieroglyphic Machine Interface Language for Communication with Auxiliary Robotic SystemsIn Rapid Fabrication Environments

United States Patent US8977378 B2 Issued March 10, 2015

Inventors: Brian Weinberg, Dinos Mavroidis

Disclosed are methods and systems for using hieroglyphs for communication in a rapid fabrication environment. The method includes receiving, by a control system for an articulated robotic arm, one or more images of a fabrication machine build space. The method includes identifying, by the control system, a hieroglyph present in the one or more images and translating the identified hieroglyph into one or more instructions for manipulation of the articulated robotic arm. The method includes causing the articulated robotic arm to carry out the instructions

translated from the identified hieroglyph.

Multiple degree of freedom rehabilitation system having a smart fluid-based, multi-mode actuator

United States Patent US20120109025 A1 Issued August 2, 2016

Inventors: Brian Weinberg, Paolo Bonato, Ozer Unluhisarcikli, Mark Sivak, Dinos Mavroidis, Anat Mirelman, Lucas Johnson, P.Eng., Pappas N., Hackmeister K., Lau D.

A rehabilitation system that combines robotics and interactive gaming to facilitate performance of task-specific, repetitive, upper extremity/hand motor tasks, to enable individuals undergoing rehabilitation to improve the performance of coordinated movements of the forearm and hand is disclosed. More specifically, the rehabilitation system includes a two degree-of-freedom (DOF) robotic, upper limb rehabilitation system and interactive gaming hardware that is coupled to a computer, to provide a virtual reality-like environment.

Cam Driven Compliant Torque Sensor

eu Patent Application PCT/US14/42335

Inventors: Brian Weinberg, Maciej Pietrusinski, Dinos Mavroidis

In many human centered robotic applications where high accuracy force control needs to be combined with backdrivable powertrains, “series-elastic” elements have been proposed as an additional component to high speed reduction transmissions. In force-controlled robots, compliant components are generally placed between the end point and the environment to help stabilize the interface, by making the environment appear "softer" to the control system. The invention introduces a new mechanism that dynamically measures torque and provides a great level of compliance for rotary/inline applications.

Gear Bearing Drive

United States Patent 8,016,893 Issued September 13, 2011

Inventors: Brian Weinberg, Dinos Mavroidis, John Vranish

A gear bearing drive provides a compact mechanism that operates as an actuator providing torque and as a joint providing support. The drive includes a gear arrangement integrating an external rotor DC motor within a sun gear. Locking surfaces maintain the components of the drive in alignment and provide support for axial loads and moments. The gear bearing drive has a variety of applications, including as a joint in robotic arms and prosthetic limbs.

Low-Profile Tool Apparatus

United States Patent Application 20110174119

Inventors: Brian Weinberg, Barbara Weinberg

The present invention generally relates to an apparatuses for the use in hard to reach areas that would otherwise be inaccessible. Specifically, this invention relates to a low-profile tool apparatus for accommodating work in areas with a limited amount of space, the low-profile tool comprised of an accessory attachment head, a spring element, one or more spring element height adjustment slots or a height adjustment mechanism, a handle and a handle extension.

Variable Resistance Hand Rehabilitation Device with Linear Smart Fluid Damper and Dynamometer Capabilities

United States Patent Application 20100041529

Inventors: Brian Weinberg, Azadeh Khanicheh, Ph.D., Dinos Mavroidis, Jim Shannon, Don Conolini

Electro-Rheological Fluid Brake and Actuator Devices

United States Patent 8,142,370 Issued March 27, 2012

Inventors: Brian Weinberg, Jason Nikitczuk, Dinos Mavroidis

Electro-rheological fluid brake or actuator devices provide controllable resistance with or without inclusion of active torque output in either direction of rotation under manual or computer control. The brake and actuator devices are suitable for use in an orthotic device for a joint, such as the knee or elbow.

Lower Extremity Exoskeleton for Gait Retraining

United States Patent US9198821 Issued December 1, 2015

Inventors: Brian Weinberg, Ozer Unluhisarcikli, Maciej Pietrusinski, Dinos Mavroidis, Paolo Bonato

Curved Bearing Contact System

United States Patent Application 11/821,095

Inventors: Brian Weinberg, elias, dinos, Qingchao KONG;

This invention relates to a curved bearing contact system and its use in a variety of systems, including a planetary gear system and a gear bearing drive.

Virtual Ankle and Balance Trainer System

United States Patent 8,206,267 Issued December 4, 2010

Inventors: Brian Weinberg, Maureen Holden, Dinos Mavroidis, Ye Ding, Joseph Malack, Rebecca Bularzik, Nathan Willard, Timothy Deso, Maciej Pietrusinski

A rehabilitation system that combines robotics and interactive gaming to facilitate performance of task-specific, repetitive exercise to enable individuals undergoing rehabilitation to improve the performance of coordinated movements of the ankle, and to practice balance activities, is disclosed. More specifically, the rehabilitation system includes at least one two degree-of-freedom robotic, haptic interface for a mammalian foot and interactive gaming hardware that is coupled to a controller, to provide a virtual reality-like environment.

Instrumented Handle and Pedal System for Use in Rehabilitation Exercise and Training Equipment

United States Patent 8,025,607 Issued September 27, 2011

Inventors: Brian Weinberg, Richard Ranky, Mark Sivak, Jeffrey Lewis, Judith Deutsch, Dinos Mavroidis

A mechatronic exercise system, e.g., for rehabilitation, having instrumented handle and pedal systems and, preferably, an interactive virtual environment is disclosed. Alternatively, the instrumented handle and pedal systems are part of a virtual reality augmenting kit that can convert most types of exercise equipment, such as a stationary or exercise bicycle, ergometer, rowing machine or the like, into full virtual reality (VR) smart systems. In another embodiment, the instrumented handle and pedal systems can each be used separately with other types of devices. In a preferred embodiment, components embedded with sensors are implemented, e.g., on a stationary, exercise bicycle to monitor physiological and biomechanical parameters of the user. Signal data from the sensing components is used to immerse the user in a VR simulation so as to provide the user with visual, auditory, and haptic feedback to the user's performance.

Orthopedic Lower Body Exoskeleton for Torque Transfer to Control Rotation of Pelvis During Gait

eu Patent Application WO2012178171 A9

Inventors: Brian Weinberg, Ozer Unluhisarcikli, Maciej Pietrusinski, Dinos Mavroidis

A robotic gait rehabilitation (RGR) training system is provided to address secondary gait deviations such as hip-hiking. An actuation assembly follows the natural motions of a user's pelvis, while applying corrective moments to pelvic obliquity. A human-robot interface (HRI), in the form of a lower body exoskeleton, is provided to improve the transfer of corrective moments to the pelvis. The system includes an impedance control system incorporating backdrivability that is able to modulate the forces applied onto the body depending on the patient's efforts. Various protocols for use of the system are provided.

System, device and method for capturing an image of multiple views of an object

United States Patent US20140260809 A1 Issued April 12, 2016

Inventors: Brian Weinberg, J. Clayton Miller, Benjamin Gallup, Grant Jordan, Justin D. Seacat, Michael S. Yacob

The invention relates generally to capturing an image of multiple views of an object, and more specifically, capturing an image of multiple views of an object in order to produce a copy of the object.

ELASTOMERIC ADAPTER CUFF

United States Patent Application 14601512

Inventors: Brian Weinberg

Enclave started with a Stratasys Objet24. Great printer, with my biggest frustrations focused on the inefficient waterjet post processing equipment. The cuff system addresses these frustrations, increasing productivity by at least 4 times by increasing user dexterity and ease of access to the work space. I am currently updating the design to accommodate both the small and large waterjets and should have product on the market in 2015.

Publications

DESIGN IMPROVEMENTS AND DESIGN METHODOLOGY FOR THE GEAR BEARING DRIVE: A COMPACT, POWERFUL AND COSTEFFECTIVE ROBOTIC ACTUATOR

ASME 2014 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference August 2014

Authors: Elias Brassitos, Qingchao Kong, Brian Weinberg, Dinos Mavroidis

As modern robotic systems begin to permeate mass productions in consumer and healthcare products, the development of powerful cost-effective compact actuators represents a critical need to deliver commercially viable high performance robotic products. During the last years our team has developed a novel approach in actuator development which overcomes gearing packaging, efficiency and reliability problems of current actuators, paving the way for a new era of low-cost highperformance robotic products that are currently unattainable with existing commercial actuators. Our new actuator assembly, called the Gear Bearing Drive (GBD), uses three components comprising a brushless outrunner motor, two stage planetary

gearbox, and novel rolling surfaces – all designed with overlapping functions and common features which interface together to drastically simplify and reduce the size and complexity of the actuator assembly. This unique approach allows embedding the motor within the planetary gearbox and further enables the actuator to operate without any traditional ball bearing, saving significant volume, cost, and manufacturing complexity. The low-cost gearbox combined with the high power output of brushless outrunner motors and typical high efficiencies of planetary gear arrangements results in compact, powerful and cost-effective robotic actuators with the potential to impact a number of industries ranging from consumer products to manufacturing and healthcare. In this paper we present the latest design improvements for the GBD so that we reduce friction and maximize efficiency. We also present a new design software for the GBD that has also been developed to reduce trial and error during the design phase and to speed up the production process.

THE GEAR BEARING DRIVE: A NOVEL COMPACT ACTUATOR FOR ROBOTIC JOINTS

ASME 2013 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference August 2013

Authors: Elias Brassitos, Brian Weinberg, Dinos Mavroidis

Advanced robotics requires a new generation of actuators able to exhibit a number of desirable characteristics ranging from high power density and high efficiency, high positioning resolution, high torque capacity and torsional stiffness, lightweight designs and low-cost packages. In this paper, we present the development and the experimental evaluation of a new actuator, aimed at improving the torque density and mechanical efficiency of actuated robotic joints, and enhancing the portability and effectiveness of robotic systems engaged in biomechanical applications such as rehabilitation robots and wearable exoskeletons. The new actuator, called the Gear Bearing Drive (GBD), consists of a two-stage planetary gear arrangement coupled through the planets and driven by an external rotor brushless motor that is inscribed within the input stage sun gear. This planetary configuration enables for incredible high-speed reductions and allows for embedding the motor directly within the gearbox saving significant space on

the actuator length. Our initial experimental prototypes have demonstrated impressive performance with the potential to deliver more than 30Nm of continuous torque with 85% mechanical efficiency and 0.0005 degree of backlash, and up to 200 rpm maximum output speed in a highly compact and robust package.

A Robotic Hand Rehabilitation System with Interactive Gaming Using Novel Electro-Rheological Fluid Based Actuators

2010 IEEE International Conference on Robotics and Automation May 2010

Authors: Ozer Unluhisarcikli, Brian Weinberg, Mark Sivak, Anat Mirelman, Paolo Bonato, Dinos Mavroidis

A newly developed hand rehabilitation system is presented that combines robotics and interactive gaming to facilitate repetitive performance of task specific exercises for patients recovering from neurological motor deficits. A two degree of freedom robotic interface allows coordinated motions of the forearm and the hand (pronation/supination and grasp/release, respectively). It is driven by two novel Electro-Rheological Fluid based hydraulic actuators. Tests were conducted to characterize these actuators, and feed-forward controllers were developed for their force/torque control. A virtual reality environment (maze game) was developed in which the robot applies force fields to the user as the user navigates the environment, forming a haptic interface between the patient and the game.

Haptic System for Hand Rehabilitation Integrating an Interactive Game with an Advanced Robotic Device

Haptics 2010: Haptic Interfaces for Virtual Environments and Teleoperator Systems March 2010

Authors: Mark Sivak, Brian Weinberg, Ozer Unluhisarcikli, Anat Mirelman, Paolo Bonato, Dinos Mavroidis

A haptic system for hand rehabilitation is presented that combines robotics and interactive virtual reality to facilitate repetitive performance of task specific exercises for patients recovering from neurological motor deficits.

NUVABAT: Northeastern University Virtual Ankle and Balance Trainer

Haptics 2010: Haptic Interfaces for Virtual Environments and Teleoperator Systems March 2010

Authors: Ye Ding, Mark Sivak, Brian Weinberg, Dinos Mavroidis, Maureen Holden

The ability to control the ankle muscles and produce adequate range of motion in the ankle joints are key components of gait and balance function. Patients who suffer from neurological impairments, such as stroke or traumatic brain injury, frequently lose

gait and balance function due in part to loss of ankle control. Described in this paper is a unique two degree of freedom (DOF) mechatronic device with a virtual reality interface that has been developed to meet the needs of such patients for ankle and balance rehabilitation.

Active Knee Rehabilitation Orthotic Device With Variable Damping Characteristics Implemented via an Electrorheological Fluid

IEEE/ASME TRANSACTIONS ON MECHATRONICS November 2009

Authors: Jason Nikitczuk, PhD, Brian Weinberg, Paul K. Canavan PhD, PT, DPT, ATC, CSCS, Dinos Mavroidis

This paper presents a novel, smart, and portable active knee rehabilitation orthotic device (AKROD) that provides variable damping at the knee joint, controlled in ways that can facilitate motor recovery in poststroke and other neurological disease patients, and to accelerate recovery in knee injury patients. The key features of AKROD include a compact, lightweight design, with highly tunable resistive torque capabilities through a variable damper component that is achieved through an electrorheological fluid (ERF) smart brake. Closed-loop torque and velocity controllers based on adaptive nonlinear control methodologies were developed and successfully implemented on the ERF brake. Preliminary testing of AKROD was performed using nine healthy subjects executing a set of isokinetic and isotonic exercises. These results were compared with exactly the same tests performed on a modern day computer controlled rehabilitation resistance machine, a Biodex System 3. The results showed comparable accuracy and repeatability between the two devices.

Variable Resistance Hand Device Using an Electro-Rheological Fluid Damper

Haptics 2009 Third Joint Eurohaptics Conference and Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems March 2009

Authors: Brian Weinberg, Azadeh Khanicheh, Ph.D., Mark Sivak, Ozer Unluhisarcikli, G. Morel, Jim Shannon, Mike Sabadosa, Goerge Bonmassar, Ben Patritti, Paolo Bonato, Dinos Mavroidis

This paper presents the design, fabrication, control and testing of the third generation prototype of a novel, one degree of freedom (DOF) Variable Resistance Hand Device (VRHD) that was designed for isotonic, isokinetic, and variable resistance grasp and release exercises.

Control of electro-rheological fluid based resistive torque elements for use in active rehabilitation devices

SMART MATERIALS AND STRUCTURES February 2007

Authors: Jason Nikitczuk, PhD, Brian Weinberg, dinos

In this paper we present control algorithms for novel electro-rheological fluid based resistive torque generation elements that will be used to drive the joint of a new type of portable and controllable active knee rehabilitation orthotic device (AKROD) for iso-inertial, isokinetic, and isometric exercising as well as gait retraining. The AKROD is composed of straps and rigid components for attachment to the leg, with a central hinge mechanism where a gear system is connected

MECHANICAL DESIGN AND MODELLING OF A ROBOTIC PLAETARY DRILLING SYSTEM

ASME 2006 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference September 2006

Authors: Yinghui Liu, Brian Weinberg, Dinos Mavroidis

Deep space drilling is necessary for appropriate chemical and biological sampling for subsurface exploration. The Robotic Planetary Drilling System (RPDS), which is currently being developed by our team, is designed to be a compact selfpropelled, steerable electromechanical drilling system that can penetrate into large depths in planetary bodies.

fMRI-compatible rehabilitation hand device

Journal of NeuroEngineering and Rehabilitation October 2006

Authors: Azadeh Khanicheh, Ph.D., Andrew Muto, Christina Triantafyllou, Brian Weinberg, Loukas Astrakas, Aria Tzika, Dinos Mavroidis

Functional magnetic resonance imaging (fMRI) has been widely used in studying human brain functions and neurorehabilitation. In order to develop complex and well-controlled fMRI paradigms, interfaces that can precisely control and measure output force and kinematics of the movements in human subjects are needed. Optimized state-of-the-art fMRI methods, combined with magnetic resonance (MR) compatible robotic devices for rehabilitation, can assist therapists to quantify, monitor, and improve physical rehabilitation. To achieve this goal, robotic or mechatronic devices with actuators and sensors need to be introduced into an MR environment. The common standard mechanical parts can not be used in MR environment and MR compatibility has been a tough hurdle for device developers.

Effects on Normal Gait of a New Active Knee Orthosis for Hemiparetic Gait Retraining

EMBS Annual International Conference August 2006

Authors: Shyamal Patel, Benjamin Patritti, Jason Nikitczuk, PhD, Brian Weinberg, Ugo Della Croce, Dinos Mavroidis, Paolo Bonato

Functional recovery of an impaired gait pattern is a common goal for stroke patients in their rehabilitation. Robotic and mechatronic devices offer a means of facilitating and enhancing gait retraining practices undertaken by clinicians. A new active knee orthosis has been developed for

gait retraining of stroke patients that may fulfill this role.

Rehabilitative Knee Orthosis Driven by Electro-Rheological Fluid Based Actuators

Proceedings of the 2005 IEEE International Conference on Robotics and Automation Barcelona, Spain, April 2005 April 2005

Authors: Jason Nikitczuk, PhD, Brian Weinberg, Dinos Mavroidis

This work aims to demonstrate the feasibility of using Electro-Rheological Fluid (ERF) actuators in orthotics, creating a new breed of rehabilitation devices.

SMART PORTABLE REHABILITATION DEVICES

ASME 2005 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference September 2005

Authors: Dinos Mavroidis, Jason Nikitczuk, PhD, Brian Weinberg, R. Arango, G.Dnaher, K. Jensen, M. Leahey, R.Pavone, P.Pelletier, A.Provo, J. Prugnarola, R. Stuart, D. Yaseva

In this paper we present several new advancements in the area of smart rehabilitation devices that have been developed by the Northeastern University Robotics and Mechatronics Laboratory. They are all compact, wearable and portable devices and boast re-programmable, real time computer controlled functions as the central theme behind their operation. The sensory information and computer control of the three described devices make for highly efficient and versatile systems that represent a whole new breed in wearable rehabilitation devices. Their applications range from activeassistive rehabilitation

Evaluation of Electrorheological Fluid Dampers for Applications at 3-T MRI Environment

IEEE/ASME TRANSACTIONS ON MECHATRONICS, VOL. 13, NO. 3, JUNE 2008 June 2008

Authors: Azadeh Khanicheh, Ph.D., Dionyssios Mintzopoulos, Brian Weinberg, Aria Tzika, Dinos Mavroidis

This paper evaluates the use of electrorheological fluids (ERFs) within a magnetic resonance imaging (MRI) environment. ERF is a semiactive variable impedance material, which could be used as an alternative type of resistive force/torque generation or in combination with other actuators as a damper/clutch to modulate the output force/torque of the actuator. In this paper, an ERF damper/brake is introduced and its magnetic resonance (MR) compatibility is examined at a 3-T MR imaging environment by measuring the output performance of the damper and the SNR of theMRI images. The experimental results showed that damper's resistive force generation while positioned within theMRI is almost the same as that in normal operation. The signal-to-noise investigation

was performed both with a phantom and human.

MR_CHIROD v.2: A fMRI Compatible Mechatronic Hand Rehabilitation Device

2007 IEEE 10th International Conference on Rehabilitation Robotics June 2007

Authors: Azadeh Khanicheh, Ph.D., D. Mintzopoulos, A Tzika, Brian Weinberg, Dinos Mavroidis

This paper presents the design, fabrication and testing of a novel, one degree of freedom (DOF) Magnetic Resonance Compatible Smart Hand Interfaced Rehabilitation Device (MR_CHIROD v.2), which may be used in brain Magnetic Resonance (MR) imaging during handgrip rehabilitation. The device consists of three major subsystems:

Design, Control and Human Testing of an Active Knee Rehabilitation Orthotic Device

2007 IEEE International Conference on Robotics and Automation

Authors: Brian Weinberg, Jason Nikitczuk, PhD, Shyamal Patel, Ben Patritti, Dinos Mavroidis, Paolo Bonato, Paul Canavan

This paper presents a novel, smart and portable Active Knee Rehabilitation Orthotic Device (AKROD) designed to train stroke patients to correct knee hyperextension during stance and stiff-legged gait (defined as reduced knee flexion during swing). The knee brace provides variable damping controlled in ways that foster motor recovery in stroke patients.

fMRI-compatible rehabilitation hand device

Journal of NeuroEngineering and Rehabilitation October 2006

Authors: Azadeh Khanicheh, Ph.D., Andew Muto, Christina Triantafyllou, Brian Weinberg, Loukas Astrakas, Aria Tzika, Dinos m

Functional magnetic resonance imaging (fMRI) has been widely used in studying human brain functions and neurorehabilitation. In order to develop complex and well-controlled fMRI paradigms, interfaces that can precisely control and measure output force and kinematics of the movements in human subjects are needed. Optimized state-of-the-art fMRI methods, combined with magnetic resonance (MR) compatible robotic devices for rehabilitation, can assist therapists to quantify, monitor, and improve physical rehabilitation. To achieve this goal, robotic or mechatronic devices with actuators and sensors need to be introduced into an MR environment. The common standard mechanical parts can not be used in MR environment and MR compatibility has been a tough hurdle for device developers.

Control of Electro-Rheological Fluid Based Torque Generation Components For Use in Active Rehabilitation Devices

SPIE06 2006

Authors: Jason Nikitczuk, PhD, Brian Weinberg, Dinos Mavroidis

The AKROD is composed of straps and rigid

components for attachment to the leg, with a central hinge mechanism where a gear system is connected. The key
features of AKROD include: a compact, lightweight design with highly tunable torque capabilities through a variable
damper component, full portability with on board power, control circuitry, and sensors (encoder and torque), and realtime
capabilities for closed loop computer control for optimizing gait retraining.

Torque Control of Electrorheological Fluidic Resistive Actuators for Haptic Vehicular Instrument Controls

Transaction of the ASME June 2006

Authors: M. A. Vitrani, Jason Nikitczuk, PhD, G. Morel, Dinos Mavroidis, Brian Weinberg

Instrument controls have haptic properties to maximize the ease of use for vehicle occupants. A single force-feedback knob can emulate the feel of conventional control knobs detents, limit stops, friction and can produce new effects as well such as vibration, scrolling, and free-spin, all instantaneously reconfigurable under computer control. Such a haptic knob can simulate the functions of all instrument controls that it replaces and thus reduced to one device, the control of the dashboard provides the driver with instant access to all functions, quickly and ergonomically. Figure 1 illustrates the concept of a multi-function haptic knob for vehicular instrument controls.

Adaptive Torque Control of Electro-Rheological Fluid Brakes Used in Active Knee Rehabilitation Devices

2006 IEEE International Conference on Robotics and Automation May 2006

Authors: Jason Nikitczuk, PhD, Abhimanyu Das, Harsh Vyas, Brian Weinberg, Dinos Mavroidis

This paper describes the development of an Adaptive Non-linear PI Torque Control for electro-rheological fluid (ERF) based variable resistance brakes that are used in compact and portable rehabilitation devices.

MR COMPATIBLE ERF DRIVEN HAND DEVICE FOR REHABILITATION AFTER STROKE

2005 ASME International Mechanical Engineering Congress and Exposition November 2005

Authors: Azadeh Khanicheh, Ph.D., Andrew Muto, Christina Triantafyllou, Brian Weinberg, Loukas Astrakas, Aria Tzika, Dinos Mavroidis

This paper presents the design, fabrication and testing of a novel, one degree of freedom, magnetic resonance (MR) compatible, computer controlled, variable resistance hand device that will be used in fMRI studies of the brain and motor performance during rehabilitation after stroke. The device

consists of four major subsystems: a) the Electro-Rheological Fluid (ERF) resistive element; b) the gearbox; c) the handles and d) the sensors: one optical encoder and one force sensor was implemented into the device design to measure the patient induced motion and force, respectively. A key feature of the device is the use of electro rheological fluids (ERF) to achieve resistive force generation.

Smart portable rehabilitation devices

Journal of NeuroEngineering and Rehabilitation July 2005

Authors: Dinos Mavroidis, Jason Nikitczuk, PhD, Brian Weinberg

The majority of current portable orthotic devices and rehabilitative braces provide stability, apply precise pressure, or help maintain alignment of the joints with out the capability for real time monitoring of the patient's motions and forces and without the ability for real time adjustments of the applied forces and motions. Improved technology has allowed for advancements where these devices can be designed to apply a form of tension to resist motion of the joint. These devices induce quicker recovery and are more effective at restoring proper biomechanics and improving muscle function. However, their shortcoming is in their inability to be adjusted in real-time, which is the most ideal form of a device for rehabilitation. This introduces a second class of devices beyond passive orthotics. It is comprised of "active" or powered devices, and although more complicated in design, they are definitely the most versatile

DEVELOPMENT OF AN ELECTRO-RHEOLOGICAL FLUIDIC ACTUATOR AND HAPTIC SYSTEMS FOR VEHICULAR INSTRUMENT CONTROL

Proceedings of IMECE2003 2003 ASME International Mechanical Engineering Congress and Exposition November 15 - 21, 2003 – Washington, D.C., USA November 2003

Authors: Avi Fisch, Jason Nikitczuk, PhD, Brian Weinberg, Juan Melli, Dinos Mavroidis

Force-feedback mechanisms have been designed to simplify and enhance the human-vehicle interface. The increase in secondary controls within vehicle cockpits has created a desire for a simpler, more efficient human-vehicle interface. Haptic systems, or systems that interact with the operator’s sense of touch, can be used to consolidate various controls into fewer, haptic feedback control devices, so that information can be transmitted to the operator and the operator can change control settings without requiring the driver’s visual attention

Electro-Rheological Fluidic Actuators for Haptic Vehicular Instrument Controls

HAPTICS 2003 - 11th International Symposium on Haptic Interfaces for Virtual Environment and Teleoperator Systems March 2003

Authors: Brian Weinberg, Juan Melli, Avi Fisch, Jason Nikitczuk, PhD, Dinos Mavroidis, Charles Wampler

Force-feedback mechanisms have been designed to simplify and enhance the human-vehicle interface. The increase in secondary controls within vehicle cockpits has created a desire for a simpler, more efficient humanvehicle interface. By consolidating various controls into a single, haptic feedback control device, information can be transmitted to the operator, without requiring the driver's visual attention. In this paper

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Management
Leadership
New Business Development
Business Strategy
Strategy
Research and Development (R&D)

Brian Weinberg

COO Safety First Arms, Inc. / CEO Enclave Technologies Inc.

brian@safetyfirstarms.com

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2 people have recommended Brian

"Brian has done work for me as a contractor to Symbient Product Development. I found him to be concientious, innovative and tenacious. He combines disciplined engineering methodology with creative thinking and a strong work ethic. He was instrumental in developing a new and patentable blood separation device for one of our customers. I would recommend without reserve."

— John Zeis, managed Brian at Enclave Technologies Inc.

"Mr. Brian Weinberg worked as a Senior Research Engineer in the Biomedical Mechatronics Laboratory at Northeastern University in Boston, MA under my supervision. Brian was the lead design and fabrication engineer of the lab and served as its manager. He performed all his duties in excellence. Brian is the best design engineer that I have worked with and I strongly and without any hesitation recommend him to you."

— Dinos Mavroidis, managed Brian at Biomedical Mechatronics Lab, Northeastern University

Contact Brian on LinkedIn