



HERL Quarterly Newsletter

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LETTER FROM THE EDITOR

HERL is proud to announce that the first ever Tech-Link Robotics Camp, which took place here at the Highland Drive VA on November 16, 2002, was a great success. Tech-Link's Executive Director, Sondra Balouris Brubaker, worked closely with HERL to plan and organize the day's activities. Our faculty, staff, and students were eager to volunteer their time to mentor teams and assist with camp activities. Everyone's dedication resulted in a fun and educational day for both the junior high students and those who worked at the event. Turn to page 7 to read more about the Tech-Link robotics camp.



HERL Students Stephanie Martin and Andy Kwarciak (center) mentoring Team Ambler at the November Tech-Link Robotics Camp

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HERL Medical Director Michael Boninger was elected to the AIMBE College of Fellows in January.

In January, our Medical Director Dr. Michael Boninger was elected to the American Institute for Medical and Biological Engineering (AIMBE) College of Fellows. AIMBE was established to promote the medical and biological engineering field and to encourage national interest in science, engineering, and education. The College of Fellows is AIMBE's core organization and its members are elected based on their accomplishments in the biological and medical engineering field as well as their participation and contributions to education and academe, industry, government, or health care.

We also learned in January that HERL student Peter C. Hunt earned the 2002 Paul G. Hearne/American Association of People with Disabilities (AAPD) Leadership Award. Peter is one of 5 awardees who were chosen out of 350 applicants by a national advisory committee. Peter was recognized for his activism in furthering the progress of disability rights programs for minorities, especially the Asian community. He will be honored at the AAPD's second annual Leadership Gala on March 4, 2003 in Washington, D.C. The award, which will be presented by a member of Congress, includes a \$10,000 cash award to further Peter's work in the disability community.

SHRS faculty members Mary Ellen Buning, Ray Burdette, and Linda vanRoosmalen and graduate students Catherine Armstrong, Yusheng Yang, and Beth Ann Kaminski volunteered to participate in this year's HOPE Network Ski Classic at Hidden Valley Ski Area on January 20-22nd. Approximately 50 individuals with disabilities either learned to ski or improved their adaptive skiing technique through this year's program. Skiers used special equipment like outriggers (crutches with skis on the bottom) or sat in special skis called bi-skis or monoskis.



Skiers using adaptive equipment at the HOPE Network Ski Classic

HERL will be heading to the 19th International Seating Symposium (ISS), which will be held from February 27-March 1 in Orlando, FL. The ISS is a forum for therapists, rehab engineering, educators, people with disabilities, and other assistive technology professionals to present papers, seminars, and instructional courses in their field. The goals of ISS are: to identify seating and mobility interventions for people with physical disabilities, discuss service delivery practices, know current research, and to understand features and clinical impact of seating and mobility technologies.

HERL thanks our newsletter readers again for your continued interest in our research. I encourage everyone to visit our website, www.herlpitt.org, to learn even more about the work we do.

Christina Hunter
Editor, HERL Q.N.

CURRENT RESEARCH ABSTRACTS

Comparison of Fatigue Life for 3 Types of Manual Wheelchairs

Shirley G. Fitzgerald, PhD, Rory A. Cooper, PhD, Michael L. Boninger, MD, Andrew J. Rentschler, BS

Purpose of the Work: There are variations in different types of wheelchairs, particularly when considering quality and performance. The purpose of this study was to determine differences in fatigue life of three types of manual wheelchairs. Depot wheelchairs, which would be found in an airport or amusement park and are not meant for long-term use, were examined along with lightweight wheelchairs and ultralight wheelchairs.

Procedures: Fatigue life is the time between when the wheelchair is first used to the point at which the wheelchair no longer serves its purpose. Essentially, fatigue life can be understood as the length of time it takes for the wheelchair to fall apart. This quality was tested in a laboratory by means of double-drum tests and curb-drop tests, during which each wheelchair was equipped with a weighted dummy to simulate actual use. The double-drum test is made up of two rollers, each of which have 1-cm high slats attached to them. The wheelchair is secured on top of these rollers so the wheels go over the slats, which simulate sidewalk cracks, door thresholds, and other various obstacles. The wheelchair passes the test when it successfully undergoes 200,000 cycles on this machine. When a wheelchair is tested on the curb-



A manual wheelchair on the double drum test machine

drop machine, it is lifted by four chains to about 5cm, which is approximately the height of a small curb. When it reaches this height, the wheelchair is allowed to free-fall to a hard surface and the process is repeated. When the wheelchair survives 6666 drops, it passes the test. The combination of the double-drum test and the curb-drop test represents 3-5 years of typical use of the wheelchair.

Results: This study examined a total of 61 wheelchairs to see which of the three types of manual wheelchairs fared the best. The ultralight wheelchairs lasted the longest, with results differing significantly from the other two types, and lightweight wheelchairs lasted longer than depot wheelchairs. There were no differences found between the type of the wheelchair's frame (rigid or folding) and whether or not it failed.

Relevance to Wheelchair Users: The data found in this study is important because it quantifies the differences in the longevity of certain chairs and how they relate to how much they cost. If a chair lasts you a long time, it will be worth its cost more so than another chair that lasts half as long. This is a quality as important as comfort and mobility in the process of selecting a wheelchair.

-Stephanie Martin

Kinetic and Physiological Analysis of the GAME^{Wheels} System

Thomas J. O'Connor, MS, Shirley G. Fitzgerald, Ph.D.,

Rory A. Cooper, Ph.D., Tricia A. Thorman, MOT, Michael L. Boninger, MD



The GAME^{Wheels} Exercise System

Purpose of the Work: The primary purpose of this study was to investigate whether the GAME^{Wheels} exercise system was harmful to the upper arms of individuals who use wheelchairs. GAME^{Wheels} is an interface between a roller system and a computer, enabling the user to play a game while exercising.

Procedures: Ten manual wheelchair users exercised on the GAME^{Wheels} System with

and without play of a video game. Data collected included forces to the arm as result propulsion as well as information regarding oxygen consumption and heart

rate during each trial.

Results: Results indicated that there were no differences in the forces between the two trials (playing the game and not playing the game) during exercise sessions. Significant differences were found between the two exercise sessions with respect to heart rate and oxygen consumption, with increased values seen when game play was occurring during exercise.

Relevance to Wheelchair Users: Exercise is important to maintaining the health and well being for all individuals. For individuals who use wheelchairs, opportunities to exercise are limited and are usually not highly motivating experiences. GAME^{Wheels} provides a safe exercise option to people who use wheelchairs.

-Shirley Fitzgerald, Ph.D.

CURRENT RESEARCH ABSTRACTS

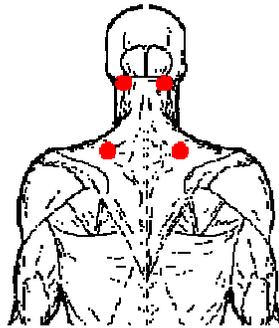
Investigating Cervical and Upper Back Pain in Wheelchair Users

Michael L. Boninger, MD, Rory A. Cooper, Ph.D., Shirley G. Fitzgerald, Ph.D., Jessica Lin, Rosemarie Cooper, M.P.T, Tricia T. Thorman, M.O.T. , Betty Liu, M.D.

Purpose of the Work: Although many doctors and other clinicians believe that neck pain is present in wheelchair users, there has been little research on how common the neck pain is and on possible diagnoses associated with the pain. Wheelchair users are exposed to vibrations as they ride in their chairs and other research has linked vibration exposure to neck pain.

Procedures: We examined 71 wheelchair users at the national veterans wheelchair games in New York City and Cleveland. Each individual had a physical examination and completed a questionnaire related to the amount and type of neck pain.

Results: Sixty six percent of subjects reported neck pain since becoming a wheelchair user and 60% reported pain during the past month. Neither age nor



length of time in a wheelchair was different between those subjects who did and those subjects who did not report pain. Of those respondents who reported neck pain, 60% visited the doctor about the pain, and 40% limited their daily activities due to the pain. Pressing on muscles reproduced pain in 54% of those wheelchair users who experienced pain in the past month. Because pressing on muscles reproduced the subjects' symptoms, it is likely that some of the pain comes from the muscles (myofascial pain). Myofascial pain can be treated effectively with deep massage and stretching.

Relevance to Wheelchair Users: Wheelchair users who have neck pain should consider talking to their doctors about the pain and possibly trying physical therapy.

-Michael L. Boninger, M.D.

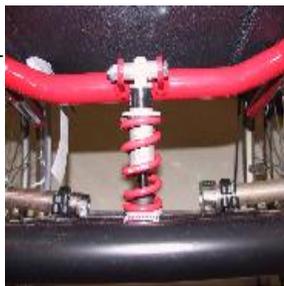
Seat and Footrest Shocks and Vibrations in Manual Wheelchairs With and Without Suspension

Rory A. Cooper, PhD, Erik Wolf, BS, Shirley G. Fitzgerald, PhD, Michael L. Boninger, MD, Rhys Ulerich, William A. Ammer, BS

Purpose of Work: To examine differences in the shock and vibration transmitted to an occupant of a manual wheelchair with and without suspension caster forks and with and without rear suspension systems.

Procedures: An ANSI/RESNA wheelchair test dummy and a Hybrid III test dummy were used to test shock and vibration transmission in wheelchairs equipped with original-equipment-manufacturer (OEM) caster forks, and suspension caster forks. Six ultralight wheelchairs, half of which had factory equipped rear-suspension systems, were tested. Testing was conducted on a double-drum wheelchair test machine. Shocks were examined to determine the effectiveness of the suspension caster forks as well as the effectiveness of the suspension in three of the six ultralight manual wheelchairs.

Results: Suspension caster forks do significantly reduce the shock and vibration exposure to the user of a manual



The Quickie XTR wheelchair's spring-dampener suspension design

wheelchair. Rear-suspension systems reduce some of the factors related to shock and vibration exposure, but they are not clearly superior to traditional designs.

Relevance to Wheelchair Users: Wheelchair users constantly encounter driving conditions which cause vibrations on the wheelchair and in turn transfer those vibrations to the rider. Over extended periods of time these vibrations can cause harmful secondary injuries like low-back pain, and spine problems. The goal of interventions such as suspension caster forks and suspension wheelchairs is to reduce these harmful vibrations and in turn reduce the risk of injury.

-Erik Wolf, B.S.

RESEARCH PARTICIPANT SPOTLIGHT: Attila Domos



Attila with girlfriend Karen and Kayla

We finally had a chance to catch up with Attila Domos when he came to the lab to participate in our New Ergonomic Pushrim study in December. Attila has been a faithful participant in many HERL research studies over the years.

Attila moved to the United States from Romania in 1980, when he was 12 years old. Music has always been his main passion in life. He writes music, plays keyboards, and sings; he's played in a few rock bands over the years. Attila is currently writing music for a rock musical he hopes to organize. He performs his music in a two-man show with his brother, Csaba. In 2001, they released a music CD called "The Many Faces of Mr. Domos." Attila hosts a website called "Attila's Music," at <http://attilasmusic.0catch.com/>, where you can download some of his songs for free.

Attila lives in Squirrel Hill with his girlfriend Karen and her daughter Kayla. He works from home, marketing for Melaleuca, an online company specializing in nutrition and health. He also runs the Pittsburgh Chapter of the Spinal Cord Society, a grassroots organization dedicated to finding a cure for Spinal Cord Injury. In his spare time, he enjoys wheeling around his neighborhood for exercise.

HERL is extremely grateful to Attila for his dedicated participation in so many of our research projects.

-Christine Heiner

RECENT HERL PUBLICATIONS

Koontz AM, Cooper RA, Boninger ML, Souza AL, Fay BT, Shoulder Kinematics and Kinetics During Two Speeds of Wheelchair Propulsion, **Journal of Rehabilitation Research and Development**, Vol. 39, No. 6, pp. 635-650, November/December 2002.

O'Connor TJ, Fitzgerald SG, Cooper RA, Thorman TA, Boninger ML, Kinetic and Physiological Analysis of the GAME^{Wheels} System, **Journal of Rehabilitation Research and Development**, Vol. 39, No. 6, pp. 627-634, November/December 2002.

Cooper RA, In Memoriam: Dr. Thomas J. O'Connor, **Journal of Rehabilitation Research and Development**, p. 625, Vol. 39, No. 6, November/December 2002.

Cooper RA, Spaeth DM, Jones DK, Boninger ML, Fitzgerald SG, Guo S, Technical Note: Comparison of Virtual and Real Electric Powered Wheelchair Driving Using a Position Sensing Joystick and an Isometric Joystick, **Medical Engineering and Physics**, Vol. 24, No. 10, pp. 703-708, December 2002.

Cooper RA, Wolf E, Fitzgerald SG, Boninger ML, Ullrich R, Ammer WA, Seat and Footrest Accelerations in Manual Wheelchairs With and Without Suspension, **Archives of Physical Medicine and Rehabilitation**, Vol. 84, No. 1, pp. 96-102, January 2003.

HERL IN THE MEDIA

Pittsburgh Tribune Review, Sunday, November 17, 2002, Page G-1: Teaming up With Technology

RESNA News, Fall 2002, Page 1: U.S. Department of Veterans Affairs Awards President-Elect with Highest Honor

Paraplegia News, November 2002, Page 65: Dr. Rory Cooper Receives Teague Award

Journal of Rehabilitation Research and Development, November/December 2002: Rory Cooper Receives VA's Prestigious Olin E. Teague Award

University Times, December 5, 2002, Page 9: Innovative Wheelchair Allows Users to Operate on Two Wheels



New Pittsburgh Courier, December 18, 2002, Page A-8: Your Health: Innovative Wheelchair

Paraplegia News, January 2003, Page 18: Bridging the Gap

Pittsburgh Business Times, January 3, 2003: Grants Fund Brain Injury Research at Pitt

Pittsburgh Tribune-Review, Saturday, January 4, 2003, Page B-2: Pitt Gets \$4M for Studies of Brain Injuries

Pittsburgh Post-Gazette, Saturday, January 4, 2003, Page D-1: Grants Boost Brain Research at Pitt

The Institute, January 6, 2003: Recognizing IEEE Members

The Wall Street Journal, January 28, 2003, Page A-6: Companies: Johnson & Johnson's I-Glide to Enter Wheelchair Market

HERL Undergraduate Student Garrett Grindle

Garrett Grindle has been working closely with Assistant Professor Dr. Songfeng Guo on a force-sensing, chin-operated joystick. This device will allow people with higher-level spinal cord injuries with limited



Dr. Guo and Garrett Grindle

upper body function to operate power wheelchairs and a complete range of other assistive devices. This force sensing type of joystick is superior to the usual chin-operated joystick as it requires almost no range of motion to operate.

Garrett and Dr. Guo first had to design and machine the joystick and the its electronics housing. Next, they connected the hardware. They are almost finished working on the software the joystick needs to be operational and they expect it to be functional in the very near future.

For Garrett, a Pitt Bioengineering student, working on the joystick project meant learning many new skills. "Before I started working at HERL, I had a very limited knowledge of electronics," said Garrett. "Dr. Guo has taught me about the function and design of circuits that sample, process, and transmit data, along with many hands-on skills, such as soldering." He also learned a great deal about microcontroller chips and software. "Dr. Guo has always been very patient to share his time and knowledge," Garret said about his mentor.



Garrett working in the machine shop

Garrett expects to graduate in spring 2004 and wants to attend graduate school. He said that his real career goal is "to invent something that innovates and betters the life of at least on person." Perhaps Garrett's work on the joystick project has inspired a career path. *-Christine Heiner*

Faculty Profile: Shirley Fitzgerald, Ph.D.

Dr. Shirley Fitzgerald had a dream to become a ballerina ever since she was a little girl. She spent her young adulthood training for a career as a professional dancer. When Dr. Fitzgerald was 18 years old and studying ballet at college, she suffered a knee injury that brought her dance career to a halt. She abruptly quit college, vowing never to open a textbook again. Dr. Fitzgerald continued to dance and teach ballet to children for the next 9 years, but her knee injury eventually caught up with her and she quit dancing for good. At the age of 27, she went back on her promise to never study again and returned to college to finish her undergraduate degree. Dr. Fitzgerald received the B.S. in athletic training from Slippery Rock University in 1991. She continued to work nonstop, earning her M.S. in health science from Slippery Rock in 1992 and her Ph.D. in epidemiology from the University of Pittsburgh's Graduate School of Public Health in 1999.



Shirley G. Fitzgerald, Ph.D., Associate Director of Research for the VA Center for Wheelchairs and Related Technology (WART)

Dr. Fitzgerald joined the Human Engineering Research Laboratories in July of 1999 and soon became the Associate Director of Research for HERL's Center of Excellence for Wheelchairs and Related Technology (WART). Although Dr. Fitzgerald's major research interests are exercise physiology and wheelchairs, her epidemiology background has exposed her to a wide variety of research areas. She has published papers on lu-

pus, arthritis, rheumatism, ophthalmology, and dance injuries.

Dr. Fitzgerald is most recognized for her involvement in HERL studies examining how service dogs can increase function and physiological well-being among wheelchair users. She also serves as the primary investigator on several studies examining clinical measures and clinician expertise in seating and wheelchair prescription. Dr. Fitzgerald is also an investigator on the GAME^{Wheels} and GAME^{Cycle} projects. Both studies aim to encourage cardiovascular fitness among wheelchair users through the use of a roller system (GAME^{Wheels}) and arm-crank (GAME^{Cycle}) controlled video game. However, Dr. Fitzgerald lends her expertise to practically every HERL research study through her role as a statistician.

Dr. Fitzgerald is also an Assistant Professor in the Department of Rehabilitation Science and Technology at the University of Pittsburgh. She teaches Research Methods to undergraduate and graduate students in the School for Health Related Sciences as well as a class on the Epidemiology of Disability. Dr. Fitzgerald also serves on the University of Pittsburgh's Internal Review Board. She has been awarded research grants from the National Arthritis Foundation, the Lupus Foundation, and from the Department of Veterans Affairs. *-Christine Heiner*

CURRENT EVENTS



The 2003 National Veterans Wheelchair Games is approaching quickly! This year's Vet games will be held from July 5-9, 2003 in Long

Beach, CA. The Games, presented by the Department of Veterans Affairs (VA) and Paralyzed Veterans of America (PVA), are open to all U.S. military veterans who use wheelchairs for sports competition due to spinal cord injuries, certain neurological conditions, amputations, or other mobility impairments. In past years' events, veterans have competed in track and field, swimming, basketball, weightlifting, softball, air guns, quad rugby, 9-ball, bowling, table tennis, archery, and wheelchair slalom.

HERL Investigators will be conducting research studies again at this year's games. We plan on continuing our datalogger and wheelchair maintenance studies from last years' games and we also plan on conducting two new studies on weight and wheelchair propulsion and the lifestyles of wheelchair users.

If you are interested in attending the 2003 National Veterans Wheelchair Games, contact: PVA Sports, (800) 424-8200 / (202) 872-1300. You can also read more about the games and download a registration form on PVA's website, <http://www.pva.org>

A martial arts school is looking for **wheelchair users in the Pittsburgh-North Hills area** to train in a **new wheelchair self-defense program**. Barry Kukovich, a teacher at Kim's Martial Arts & Fitness, has designed this Judo, Aikido, and Karate-based system specifically for wheelchair users. He's looking for one or two wheelchair users to train with him to become pioneers of this new art. If you are interested in helping to lead the way in wheelchair self-defense, please contact Barry at the studio: (724) 774-4994.



If you know of a current event or have an ad that you would like to post in the HERL Quarterly Newsletter, please contact Christine Heiner at (412) 365-4854 or by e-mail at heinercm@pitt.edu

ability of the investigational drug HP184.

How Long: The study will last 13 days→12 consecutive days as an inpatient at the General Clinical Research Center (GCRC)

Benefits: \$100 per day payment for your participation

For Further Information Contact: Tina at The Department of Physical Medicine and Rehabilitation - (412) 648-6898

Wilderness Inquiry, a non-profit organization that provides **outdoor adventures for people of all ages, backgrounds, and abilities**, has a number

of trips coming up this summer. They offer multiple-day canoeing, rafting, backpacking & kayaking expeditions and work hard to accommodate people who have disabilities. Most trips take place in remote areas all over the



United States and parts of Canada. If you are interested in joining a Wilderness Inquiry outdoor adventure, you can contact them by phone: (800) 728-0719 or (612) 676-9400, e-mail: info@wildernessinquiry.org, or visit their website, www.wildernessinquiry.org.

The 2003 Jean Driscoll Sports and Training Camp will be held from **June 16- 20** (Monday through Friday) at the University of Illinois at Urbana-Champaign. This wheelchair sports camp is an annual five-day program which includes

- physical training sessions twice each day
- instruction in the mechanics and strategies of wheelchair sports
- guidance and encouragement for those desiring to coach athletes with disabilities
- opportunities for participants to join together in prayer, worship, and Bible study

The Sports and Training Camp is open to

- men and women ages 18 and older
- wheelchair users interested in developing their athletic skills
- individuals interested in coaching wheelchair sports
- individuals interested in coaching wheelchair sports on a "Wheels for the World" outreach

Space is limited and reservations are taken on a first-come, first-served basis. The **registration and payment deadline is May 26, 2003**. To download a registration form and learn more about the program, visit <http://www.joniandfriends.org/outreach/wftw/sportscamp.html> or contact the sports camp coordinator, Nicki Heyd, at (818) 707-5664.



SUBJECTS NEEDED



Study Sponsor: Aventis Pharmaceuticals, Inc.

Who: The University of Pittsburgh-Department of Physical Medicine and Rehabilitation is seeking men and women, 18 to 55 years of age who have sustained a chronic spinal cord injury more than 18 months ago to participate in an investigational drug study.

Purpose of Study: The examine the safety and toler-

AGENCY SPOTLIGHT: Tech-Link

The Tech-Link program of Pittsburgh, Pa is a non-profit organization with a mission to introduce students with disabilities to careers in math, science and technology. Tech-Link offers career development opportunities for academically oriented students from middle school to early adulthood who have motor, visual and auditory impairments. Tech-Link promotes a philosophy that students with disabilities should live functional and independent lives. They promote this belief by expanding the student's knowledge of high-tech careers and providing the opportunity to pursue those careers.

HERL has enjoyed a long relationship with Tech-Link, starting in 1997 when we formed a team to compete in the FIRST Robotics Competition. HERL Engineers and students mentored the "Pitt Crew" team of high-school students, both with and without disabilities. The goals of the FIRST competition were to design and build a large robot and program it to perform a series of tasks, such as picking up rubber balls and placing them on a high beam.

In 2002, Tech-Link and HERL tried inspiring interest in science & technology careers in even younger students. On November 16, Tech-Link hosted it's first robotics camp for junior high students. The day-long camp, sponsored by Mitsubishi Electric America



The teams crowd around the playing table as Erik Wolf explains the competition rules.

Foundation and Howard Heinz Endowments, was held in the recreation hall at the VA Pittsburgh Healthcare System's Highland Drive Division.

HERL faculty, staff, and students mentored the junior high teams in building and programming robots made from LEGOs. The teams' robots later competed against each other on Pittsburgh-themed playing fields. The teams made their robots complete tasks such as pressing a button to turn on a light on Pitt's Cathedral of Learning and moving tiny Heinz Ketchup crates.

The teams were named after the famous robots Rosie, Raptor, RRV, Sojourner (SOJO), and Ambler. Jim Osbourne, competition judge and Executive Director of the Medical Robotics Technical Center at the



A robot attempts to push the competition off the playing table

Carnegie Mellon Robotics Institute, educated the junior high kids about the real-life robots.

The competition judges gave out awards to the Most Creative team (Team Ambler), Best Team Effort (Team RRV), Best Looking Robot (Team SOJO), Most Spirited (Team Raptor) and Best Match Score (Team Rosie & Team Ambler). Team Rosie, lead by HERL mentors Mark

McCartney and David Algood, was the tournament winner.

To learn more about the Tech-Link Robotics Camp and to see more pictures from the day's events, visit their website, <http://www.tech-link.org>.

-Christine Heiner

FEATURED HERL STUDENT: Erik Wolf



Erik J. Wolf

Erik J. Wolf joined the Human Engineering Research Labs as a Pitt Engineering undergraduate student in 1998. He enjoyed working at HERL and decided to continue to earn a masters and doctoral degree in Bioengineering. Erik has worked on many projects while working at HERL such as power wheelchair standards testing, measuring wheelchair vibration on various surfaces for

the Interlocking Concrete Pavement Institute, and suspension wheelchair studies. In September of 2000, he successfully defended his master's thesis, in which he compared different wheelchair cushions' effectiveness

in preventing vibration from transferring to wheelchair users during propulsion.

Erik demonstrated his impressive leadership skills this past November when he assumed lead student responsibilities for the first Tech-Link Robotics Camp. Erik and HERL technical coordinator Bill Ammer lead a team of students in designing and building playing fields, planning the competition events, and mentoring the camp teams. He also served as the emcee for the day-long event.

Erik hopes to receive his Ph.D. in December of 2004. Although he is still undecided on what career he wants to pursue, he says he would like to do a post-doctoral fellowship somewhere abroad or continue in the university setting as a professor.

-Christine Heiner

Human Engineering Research Laboratories

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the newsletter to the editor, Christine Heiner at:
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VA Center Of Excellence For Wheelchair
And Related Technology
University of Pittsburgh Model Center on
Spinal Cord Injury

Rory A. Cooper, Ph.D.
Director

Michael L. Boninger, M.D.
Medical Director

Shirley G. Fitzgerald, Ph.D.
Associate Director of Research,
VA R&D Center of Excellence for
Wheelchair and Related Technology

Interested in Participating in a HERL Research Study?

Research studies at our laboratories involve participants who utilize manual or power wheelchairs as a means for mobility. The majority of our studies involve a visit to the Human Engineering Research Laboratories located at the Highland Drive VA Medical Center in Pittsburgh, PA. However, some of our studies are survey based and do not involve travel.

*If you're interested in participating
in a HERL Research Study, contact
our clinical coordinators Rosemarie
Cooper or Annmarie Dobson at
(412) 365-4850.*

If you are interested in obtaining further information about how you can participate in current or future studies, please contact Annmarie or Rosi, Clinical Coordinators for the Human Engineering Research Laboratories at (412) 365-4850. We look forward to hearing from you.

