

Human Engineering Research Laboratories  
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## EDUCATION

### Graduate School

- Doctor of Philosophy (PhD, Rehabilitation Science and Technology) Sep 2012 – Jun 2018\*  
School of Health and Rehabilitation Sciences,  
University of Pittsburgh, Pittsburgh, PA  
*\*(Expected date of graduation - Finished all classes and credits except dissertation project)*  
*Dissertation:* Quantifying Powered Mobility Driving Capacity  
*Advisors:* Dr. Rory Cooper & Dr. Brad E Dicianno  
*Committee:* Dr. Michael Boninger, Dr. Mark Schmeler
- Masters of Science (MS, Rehabilitation Science and Technology) Aug 2011 - Dec 2014  
School of Health and Rehabilitation Sciences,  
University of Pittsburgh, Pittsburgh, PA

### Medical School

- Bachelor of Medicine, Bachelor of Surgery (M.B.B.S)  
Jawaharlal Nehru Medical College, Belgaum, Karnataka, India Sep 2000 - Mar 2006

### Certifications

- Certified Assistive Technology Professional Dec 2014
- Medical School Diploma Mar 2007
- Permanent License to practice in India May 2007
- ECFMG Certified Jun 2008
  - USMLE Step 1 Jul 2007
  - USMLE Step 2 ck Dec 2007
  - USMLE Step 2 cs
  - USMLE Step 3 Feb 2010
- Advanced Placement International English Language (APIEL). Jul 1999

## AWARDS & HONORS

- 2017 Graduate Student Representative, Dept. of Rehabilitation Science & Technology for the Pitt Harrisburg Day to represent the University of Pittsburgh at the Pennsylvania State Capitol.  
**“Todd Hargroder Award”**, a honorary award for outstanding advancements in the field of assistive technology through superior research efforts and communalization of new technology awarded by the Department of Rehabilitation Science and Technology, University of Pittsburgh
- 2016 Third Place, **ACRM “Best Poster Award”**. ACRM 93rd Annual Conference, Progress in Rehabilitation Research (PIRR), Chicago, Illinois.  
**Travel Award**  
 University of Pittsburgh Graduate & Professional Student Government **Travel Award**
- 2012 **“Virginia Kaufman Award”**, a honorary award for excellence in Rehabilitation Science and Technology awarded by the Department of Rehabilitation Science and Technology, University of Pittsburgh  
**Honoree Student**, School of Health & Rehabilitation Sciences, University of Pittsburgh

## GRANTS

- 2017 Co-investigator. “Assessing the effectiveness of virtual reality for Power Wheelchair Driving Training”. Funded by the Promobilia Foundation, Sweden.

## PUBLICATIONS

### Peer-reviewed articles

1. **Kamaraj DC**, Bray N, Rispin K, Kankipati P, Pearlman J, Borg J; A Conceptual Framework to Assess Effectiveness in Wheelchair Provision. African Journal of Disability, 2017.  
<http://www.ajod.org/index.php/ajod/article/viewFile/355/654>
2. **Kamaraj DC**, Dicianno BE, Mahajan H, Buhari A, Cooper RA; Inter-Rater Reliability Of The Power Mobility Road Test In The Virtual Reality Based Simulator 2. Archives of Physical Medicine and Rehabilitation, Jul 2016. 97(7): 1078-1084. [doi:10.1016/j.apmr.2016.02.005](https://doi.org/10.1016/j.apmr.2016.02.005)
3. **Kamaraj DC**, Dicianno BE, Mahajan H, Buhari A, Cooper RA; Stability and Workload of the Virtual Reality Based Simulator 2. Archives of Physical Medicine and Rehabilitation, Jul 2016. 97(7):1085-1092.e1. [doi:10.1016/j.apmr.2016.01.032](https://doi.org/10.1016/j.apmr.2016.01.032)
4. Candiotti,J., Wang H., Chung CS., **Kamaraj DC.**, Grindle, G. G., Shino M., & Cooper, R. A. Design and Evaluation of a Seat Orientation Controller during Uneven Terrain Driving. Medical Engineering & Physics, Mar 2016. 38(3):241-7. [doi:10.1016/j.medengphy.2015.12.007](https://doi.org/10.1016/j.medengphy.2015.12.007)
5. **Kamaraj DC**, Dicianno BE, Cooper RA; “A Participatory Approach to Develop The Power Mobility Clinical Driving Assessment Tool”. Biomed Research International, Sep 2014, 541614. Special Issue on Wheeled Mobility [doi:10.1155/2014/541614](https://doi.org/10.1155/2014/541614)
6. **Kamaraj DC**, Dicianno BE, et al; “Acute Mountain Sickness in athletes with neurological impairments” Journal of Rehabilitation Research and Development. Journal of Rehabilitation Research and Development. Apr, 2013; 50(2):253-62. [doi:JRRD.2012.03.0042](https://doi.org/10.1155/2014/541614)

7. Boova R, Gahlawat V, **Kamaraj DC**; Transit time flow Measurements in Off Pump Coronary Artery Bypass Surgery. Department of Surgery Case Western Reserve University School of Medicine Research Abstract Bulletin. Jun 2012.
8. **Kamaraj DC**, Chandra et al; “Nutritional status of Anganwadi children in 4 sub-centres of Primary Health centre, Kinaye: A Cross-sectional Study”; The Journal of the Scientific society. Oct 2008. 35, 4, 103 – 7, PMID: ISSN-0974-5009)

### **Book Chapters**

1. **Kamaraj DC**, Cooper R; “Reintegration through Virtual Reality”. Promoting Successful Reintegration: A Practical Handbook, edited by Cooper R A, Etter D, and Pasquina P F, 1<sup>st</sup> edition. Borden Institute, 2014.
2. **Kamaraj DC**, Klass S, Cooper R; “Recreation and Sports for a child with Spinal Cord Injury”. Trans. Array A Child with Spinal Cord Injury. Mulcahey M J, Betz R, Vogel L C, Zebracki K, .2<sup>nd</sup> edition. Mac Kieth Press, 2013.

### **Peer-reviewed Conference Abstracts (Poster presentations)**

1. Sivaprakasam A, Bass S, **Kamaraj DC**, Koontz A. Investigating Wheelchair Seating Parameters and Their Effect on Ramp Propulsion. Poster Presentation at the BMES Annual meeting 2017. Phoenix, AZ
2. **Kamaraj DC**, Mahajan P, Boyanoski T, Dicianno BE, Cooper RA (2017, Feb). Psychometric Properties of the Quantitative Driving Metrics in VRSIM-2. Poster presentation. Annual meeting for the AAP 2017, Las Vegas, NV
3. Nilsson L, **Kamaraj DC** (2017, May). Systematic overview of instruments and methods of assessment and training prior to prescription of electric wheelchair. Arbetsterapiforum, At Malmö, Sweden, Volume: 13.
4. **Kamaraj DC**, Mahajan H, Dicianno BE, Terhorst L, Cooper R (2016, Oct). Discriminative Ability Of The Quantitative Electric Powered Wheelchair Driving Metrics In VRSIM-2. Poster presentation. ACRM 93rd Annual Conference, Progress in Rehabilitation Research (PIRR), Chicago, Illinois.
5. Hogaboom N, Worobey L, **Kamaraj DC**, Boninger M (2016, Oct). Relationship between Power-Wheelchair Skills and Measures of Independence and Mobility in People with Spinal Cord Injury. Poster presentation. ACRM 93rd Annual Conference, Progress in Rehabilitation Research (PIRR), Chicago, Illinois.
6. **Kamaraj DC**, Mahajan H, Dicianno BE, Terhorst L, Cooper R (2016, Jun). Ecological Validity Of The Virtual Reality Based Electric Powered Wheelchair Driving Simulator. Poster presentation. European Seating Symposium, Dublin, Ireland.
7. **Kamaraj DC**, Boyanoski T, Dicianno BE, Cooper RA (2016, May). “Objective Quantification of Power Wheelchair Driving Ability”. Poster presentation. NIH meeting: Moving the Field Forward, held at Bethesda, MD.

8. **Kamaraj DC**, Dicianno BE, Cooper R (2016, May). Discriminative ability and predictive validity of Quantitative Driving Metrics. Poster presentation. Annual Rehabilitation Institute Research Day, University of Pittsburgh, Pittsburgh, PA.
9. **Kamaraj DC**, Dicianno BE, Cooper R (2016, Feb). Predicting Electric Powered Wheelchair Driving Performance Based on Virtual Driving Performance. Poster presentation. Annual Meeting of the Association of Academic Physiatrists. Sacramento, CA.
10. **Kamaraj DC**, Dicianno BE, Youk A, Mahajan H, Cooper R (2015, Oct). Perceived Work Load Between Experienced & Novice Power Wheelchair Users While Interacting With a Wheelchair Driving Simulator. Poster presentation. American Congress of Rehabilitation Medicine Annual Conference, Dallas, TX.
11. Akins JS, **Kamaraj DC**, Cooper RA, Brienza DM (2015, Oct). Unilateral Transtibial Amputees Use Symmetric Joint Moments and Response Latencies Following Perturbations. Poster presentation. American Congress of Rehabilitation Medicine Annual Conference, Dallas, TX.
12. **Kamaraj DC**, Dicianno BE, Cooper R (2015, May). Feasibility of assessing electric power wheelchair driving capacity in a wheelchair-driving simulator. Poster presentation. Annual Rehabilitation Institute Research Day, University of Pittsburgh, Pittsburgh, PA
13. Akins JS, Ashoff AW, **Kamaraj DC**, Brienza DM, Cooper RA (2014, Jul). Single-leg Balance Control Strategies of Prosthetic Users: Development of a Perturbed Balance Protocol and Preliminary Data. 7th World Congress of Biomechanics, Boston, MA.
14. Boova R, Gahlawat V, **Kamaraj DC** (2012, Jun). Transit time flow Measurements in Off Pump Coronary Artery Bypass Surgery. Poster presentation. The New Orleans Conference: Practices in Cardiac Surgery and Extracorporeal Technology, New Orleans, LA.
15. Piva SR, Almeida G, Sowa G, **Kamaraj DC** (2012, May). Feasibility of a Comprehensive Behavioral Intervention in Total Knee Arthroplasty. Poster presentation. Annual Rehabilitation Institute Research Day, University of Pittsburgh, Pittsburgh, PA
16. **Kamaraj DC**, Dicianno B E, Mahajan H, Cooper R (2012, Feb). Workload assessment of a 3d immersive technology system to assess power wheel chair driving performance. Poster presentation. Annual meeting of the Association of Academic Physiatrists, Las Vegas, NV.

### Peer-reviewed Conference Abstracts (Podium Presentations)

1. **Kamaraj DC**, Terhorst L, Hogaboom N, Worobey L, Boninger M (2017, Oct). Factor Structure of the Wheelchair Skills Test. Paper Presentation. ACRM 94th Annual Conference, Progress in Rehabilitation Research (PIRR), held in Atlanta, GA.
2. **Kamaraj DC**, Raad J P, Mallinson T (2017, Oct). Outcomes and Measurement in Rehabilitation Research and Practice - The State of Science. Symposium Presentation. ACRM 94th Annual Conference, Progress in Rehabilitation Research (PIRR), held in Atlanta, GA.
3. **Kamaraj DC**, Bray N, Rispen K, Borg J, Kankipati P, Pearlman J (2017, Mar). A Conceptual Model for Comparing Effectiveness in Wheelchair Provision. Instructional Course. International Seating Symposium, Nashville, TN.
4. **Kamaraj DC**, Nilsson L, Dicianno BE, Minkoff A, Cooper R (2016, Oct). A Comprehensive Review of Adult and Child Powered Mobility Driving Assessments and Training Interventions.

Instructional Symposium. American Congress of Rehabilitation Medicine Annual Conference, Chicago, IL.

5. **Kamaraj DC**, Cooper R (2015, Feb). Studying Wheeled Mobility in the Computer Assisted Rehabilitation Environment. Podium Presentation. International Seating Symposium, Nashville, TN.
6. **Kamaraj DC**, Dicianno BE, Schmid M, Boyanoski T, Cooper RA (2014, June). “Quantifying Power Wheelchair Driving Ability”. Podium Presentation. Annual Conference of RESNA, Indianapolis, IN.

### INVITED LECTURES

1. **Kamaraj DC** (2016, June). Virtual Reality based Assistive Technology: The past, present and the future. Presented at Dept. of Rehabilitation Engineering, Lund University, Lund, Sweden.
2. **Kamaraj DC** (2015, Feb). Quantitative assessment of power wheelchair driving capacity. Instructional Course Presentation at the International Seating Symposium, Nashville, TN.
3. **Kamaraj DC & Atkins** (2014, Sep). 20 Years of Virtual Reality at HERL. From Game Wheels to gaming in the Computer Assisted Rehabilitation Environment. VA Center of Excellence and Associated Engineering Lecture Series. Human Engineering Research Laboratories, Pittsburgh, PA.
4. **Kamaraj DC** (2014, March). Virtual Reality at the Human Engineering Research Laboratories. Presentation for the Sci-Tech Festival at the Carnegie Science Center, Pittsburgh, PA.
5. **Kamaraj DC & Mahajan H** (2013, September); Electric Power Wheelchair Driving Assessment using Virtual Reality at the Human Engineering Research Laboratories. Presentation at the 1199SEIU Symposium on Wheelchair Assessment, New York, NY.
6. **Kamaraj DC** (2012, November); Virtual Reality and Electric Power Wheelchair Driving assessment at HERL. Oral presentation for the State of science symposium at Walter Reed National Military Medical Center, Bethesda, MD.
7. **Kamaraj DC** (2009, June). Transit time flow Measurements in Off Pump Coronary Artery Bypass Surgery. Presented at the Grand rounds, Department of Cardiothoracic Surgery, Bryn Mawr Hospital, Bryn Mawr, PA.

### ACADEMIC SERVICE

#### Peer manuscript reviewer

- 2017 - present International Journal of Medical Informatics
- 2016 IEEE Transactions on Neural Systems & Rehabilitation Engineering
- 2015 IEEE Medical Engineering & Physics
- 2014 - present Assistive Technology
- 2012 - present Archives of Physical Medicine and Rehabilitation

#### Grant reviewer

- 2016 Paralyzed Veterans of America

## TEACHING EXPERIENCE

- **Spring 2012: Rehabilitation Engineering and Assistive Technology Practices**  
 Role: Teaching Assistant, Laboratory coordinator  
 Class size: 25 graduate and 7 undergraduate students
- **Spring 2014: Ethical Issues in Healthcare**  
 Role: Teaching assistant  
 Class size: 40 Graduate students
- **Fall 2016 & Spring 2017: Psychometrics Journal Club**  
 Role: Co-instructor  
 Class size: 10 Doctoral students

## RESEARCH EXPERIENCE

- Research Associate & Graduate Student Researcher      Human Engineering Research Laboratories  
 University of Pittsburgh      Sep 2012 – Present  
*Virtual Reality and Powered mobility*
- Pre-doctoral Research Fellow      Human Engineering Research Laboratories  
 University of Pittsburgh      Nov 2010 – Aug 2012  
*Virtual Reality and Powered mobility*
- Research Assistant      Department of Physical Medicine & Rehabilitation  
 Department of Physical Therapy  
 University of Pittsburgh      Jan 2012 – May 2012  
*Serum Biomarkers in total knee arthroplasty*
- Research Assistant      Department of Cardiothoracic Surgery  
 Bryn Mawr Hospital, Bryn Mawr, PA      Apr 2009 - Apr 2010  
*Transit time flow measurements in OPCAB*
- Co-investigator      Department of Pulmonary, Critical Care & Sleep Medicine  
 Rakshith Hospital, Chennai, India      May 2008 - Aug 2008  
*Clinical drug trials*
- Research Volunteer      Department of Urology  
 Madras Medical College, India      Jul 2006 - Aug 2008  
*Data analysis for three Urology studies*
- Research Assistant      Department of Community Medicine  
 Jawaharlal Nehru Medical College, India      Apr 2005 - Jun 2005  
*Nutritional status of children under a Primary Health Center*

## US CLINICAL EXPERIENCE

### Clinical Internship

- Physical Medicine & Rehabilitation, University of Pittsburgh, Pittsburgh, PA Sep - Oct 2017  
(In-patient rotation: UPMC Montefiore Hospital & UPMC Mercy Hospital)

### Rehabilitation Eng. Internship

- Physical Medicine & Rehabilitation, University of Pittsburgh, Pittsburgh, PA Jun 2012 - Jul 2012  
(Outpatient rotation: Spina Bifida clinic at Children's Hospital & Center of Assistive Technology)

### Sub-internship

- Physical Medicine & Rehabilitation, University of Pittsburgh, Pittsburgh, PA Aug 2012  
(In-patient rotation: Spinal Cord Injury Floor, UPMC Mercy Hospital)

### Observership / Externship

- Physical Medicine & Rehabilitation University of Pittsburgh, Pittsburgh, PA Sep - Oct 2010
- Dept. of Rehabilitation Medicine General Physiatrist, Springfield, MA Jul - Aug 2010
- Dept. of Cardiothoracic Surgery Bryn Mawr Hospital, Bryn Mawr, PA Apr 2009 - Apr 2010
- Dept. of General Surgery University of Miami, Miami, FL Jan - Mar 2009
- Dept. of General Surgery Georgetown University, Washington, DC Sep - Nov 2008

## WORK EXPERIENCE

- Resident Medical Officer Rasi Hospital, Chennai, India May 2006 - Jul 2010
- Casualty Medical Officer Rakshith Hospital, Chennai, India May - Aug 2008
- Internship J.N. Medical College, Belgaum, India Apr 2005 - Apr 2006

## ADMINISTRATIVE EXPERIENCE

- Board of Directors, Pittsburgh Regional Healthcare Initiative (2014-15), Pittsburgh, PA
- Member, Administrative Board (2008-10), Rasi Hospital, Chennai, India
- Director of Sports (2003-04), Student Council, Jawaharlal Nehru Medical College, Belgaum, India

## AFFILIATIONS & MEMBERSHIPS

- Association of Academic Physiatrists
- American Congress of Rehabilitation Medicine, *Measurement Networking Group (Early Career Task Force Chair)*, *ACRM Physicians and Clinicians Group*
- International Society of Wheelchair Professionals (ISWP), *Co-Chair, Comparative Effectiveness Research Sub-committee*
- Indian Medical Association

## MEDIA

- Adam Savage's [Tested](#)
- [Archives of PMR Podcast](#)
- [Pitt News](#)
- [Pittsburgh Post-Gazette](#)
- [TIME](#)
- [HERL Newsletter](#)
- [Paralyzed Veterans of America](#)

## OTHER ACCOMPLISHMENTS

- 2011 **Team Physician** and coordinator for the design team to build a robotic feeding device, **Rhobite™**. Rhobite was one of the Finalists for the 2012 M G Wells Student Health care Entrepreneurship competition, conducted by the University of Pittsburgh.
- 2006 **“Best Outgoing Sportsman” Award**, for excellence in Sports and Leadership, awarded by Jawaharlal Nehru Medical College, Belgaum, Karnataka, India
- 2005 **Honorary Scholarship** for Excellence in Sports awarded by Rajiv Gandhi University of Health Sciences, Bangalore, India
- 1999 Pre-degree - Third in the state of Tamil Nadu, India in Physics (98%)

## SKILLS, ACTIVITIES & INTEREST

- Career Interests: Adaptive sports & Assistive technology, Virtual Reality and gaming based rehabilitation, Rehabilitation Related Outcomes Research, Transitional Research and Medical Education
- Technical Skills: Familiar with using Microsoft Office, technical software such as Solidworks, Matlab, CAREN (D-flow), and Maya. Proficient Statistical software packages: SPSS and STATA
- Volunteer activities:
  - National Veterans Wheelchair Games 2011, Pittsburgh, PA
  - National Veterans Wheelchair Games 2017, Cincinnati, OH
  - National Conference of the Indian Association of Preventive and Social Medicine, Belgaum, India.
- Languages: Proficient in English, Tamil, Kannada and Hindi