

## **CURRICULUM VITAE**

### **Hari J. Balasubramanian**

Associate Professor  
University of Massachusetts Amherst

Mechanical and Industrial Engineering  
160 Governors Drive  
Amherst, MA 01003  
Tel: 413-577-3208  
*email:* hbalasubraman@ecs.umass.edu  
*fax:* 413-545-1027

## **I. PERSONAL**

### **A. Education**

- Postdoctoral Research Associate, Department of Health Sciences Research, Mayo Clinic, Rochester, MN, August 2006-2008
- PhD, Arizona State University, August 2006
- Master of Science (M.S), Arizona State University, August 2002
- Bachelor of Engineering (B.E) , Production Engineering, Regional Engineering College, Trichy, India

### **B. Academic and Professional Positions**

- Associate Professor, Mechanical and Industrial Engineering, University of Massachusetts, Amherst, Fall 2014-Present
- Assistant Professor, Mechanical and Industrial Engineering, University of Massachusetts, Amherst, Fall 2008-Spring 2014
- Visiting Research Collaborator, Department of Health Sciences Research, Mayo Clinic, Rochester, MN, Sept 2008 – Sept 2010
- Post-doctoral Research Associate, Department of Health Sciences Research, Mayo Clinic, Rochester, MN, August 2006 – August 2008
- Research Associate, Modeling and Analysis of Semiconductor Manufacturing (MASM) Lab, Department of Industrial engineering, Arizona State University, August 2000-August 2006

### **C. Awards and Honors**

- NSF CAREER Award, 2013-2018
- IE Professor of the Year Award (student elected): 2012, 2013 and 2014
- Finalist, Doing Good with Operations Research Competition, Institute of Operations Research and Management Science (INFORMS), 2010, for the paper, “Optimization of Prostate Biopsy Referral Decisions”
- Finalist, Pierskalla Award for Healthcare Operations Management, Institute of Operations Research and Management Science (INFORMS), 2010, for the paper, “Optimization of Prostate Biopsy Referral Decisions”

## **III. RESEARCH**

### **Grants (Awarded/Active/Completed)**

[G1] PI, *National Science Foundation*, NSF CAREER: Stochastic Models for Designing the Patient Centered Medical Home, Amount: \$400,000, July 2013 – July 2018 [**Active**]

[G2] PI, *Baystate Medical Center*, (Springfield, MA) Exploratory Models for Inpatient Capacity Management, Amount: \$35,000, November 2012 - November 2014 [**Active**]

[G3] PI, *National Science Foundation*: CMMI 1031550, Balancing timely access and patient-physician continuity in primary care, Award Amount: \$272,000, Fall 2010 - Fall 2013 (co-Is: Ana Muriel and James Stahl). [**Completed**]

[G4] PI, *Agency of Healthcare Research and Quality* (AHRQ), of R03 HS18795-01: Improving Patient Access and Patient-Clinician Continuity Through Panel Redesign, Award Amount:\$100,000, Spring 2010-Spring 2012 (co-I: James Stahl). [**Completed**]

[G5] PI (along with Eric Dickson of UMass Medical School) of Improvement of emergency department flow using discrete event simulation and wireless identification technology, The Life Sciences Moment Fund (LSMF), University of Massachusetts Medical School, Award Amount: \$150,000 (total), Fall 2009--Fall 2011. [**Completed**]

[G6] PI of “Discrete event simulation for modeling the hospital admission and discharge processes”, Department of Emergency Medicine at Baystate Medical Center, Springfield, MA, Award Amount: \$5000, January 2012 – May 2012 [**Completed**]

[G7] The Hluchyj Fellowship: An engineering and nursing fellowship provided by alumni Terry and Mike Hluchyj: Awarded to my doctoral student, Asli Ozen, \$25,000, Fall 2010 – August 2011. [**Completed**]

[G8] Gao, S. (PI) and H. Balasubramanian (co-I). Trajectory-Adaptive Route Choice Models: Specification, Choice Set Generation, and Estimation. US Department of Transportation through New England University Transportation Center. Sep. 2010 - Aug. 2011. \$79,302. [**Completed**]

[G9] PI of Improving primary care access using simulation optimization, Award amount: \$10,000, Mayo Clinic Small Grants Program, Spring 2007-Spring 2008. [**Completed**]

[G10] PI of Education Grant: Case studies in healthcare operations research, Mayo Clinic Small Grants Program, Award amount: \$10,000, Spring 2007-Spring 2008. [**Completed**]

### **Internship Funding involving UMass students**

[I1] Graduate Summer Internship for PhD Student (Asli Ozen), “Optimal scheduling of spine surgeries”, Department of Health Sciences Research, Mayo Clinic, Rochester, MN, Summer 2012, Award Amount: \$8000.

[I2] Baystate Summer Scholars Program of Undergraduates (Brendan Walsh), Summer 2010, Award Amount: \$3500.

[I3] Graduate student externship with tuition waiver for M.S student Cami Chen at Baystate Medical Center (Oct 2013 – Present), Amount: \$8000

## IV. PUBLICATIONS

### A. Refereed Journal Articles Accepted or Published (students indicated with \*)

[P21] Shin, S-Y\*, Brun, Y., Balasubramanian, H., Osterweil, L., and Henneman, P., Discrete event simulation and integer-linear programming for constraint-aware resource scheduling, *IEEE Transactions on Systems, Man and Cybernetics*, published online, 2017.

[P20] Ozen, A.\*, Marmor, Y., Rohleder, T., Balasubramanian, H., Huddleston, J., & Huddleston, P. (2015). Optimization and simulation of orthopedic spine surgery cases at Mayo Clinic. *Manufacturing & Service Operations Management*, 18(1), 157-175.

[P19] Henneman, P. L., Shin, S. Y.\*, Brun, Y., Balasubramanian, H., Blank, F., & Osterweil, L. J. (2015). Using computer simulation to study nurse-to-patient ratios in an emergency department. *Journal of Nursing Administration*, 45(11), 551-556.

[P18] Henneman, P. L., Nathanson, B. H., Ribeiro, K.\*, & Balasubramanian, H. (2014). The impact of age and gender on resource utilization and profitability in ED patients seen and released. *The American Journal of Emergency Medicine*, 32(10), 1159-1167.

[P17] Stahl, J. E., Balasubramanian, H. J., Gao, X\*., Overko, S.\*, & Fosburgh, B. (2014). Balancing Clinical Experience in Outpatient Residency Training. *Medical Decision Making*, 34(4), 464-472.

[P16] Khowala, K.\*, Fowler, J., Keha, A., & Balasubramanian, H. (2014). Single machine scheduling with interfering job sets. *Computers & Operations Research*, 45, 97-107.

[P15] Oh, H. J., Muriel, A., Balasubramanian, H., Atkinson, K., & Ptaszkiewicz, T. (2013). Guidelines for scheduling in primary care under different patient types and stochastic nurse and provider service times. *IIE Transactions on Healthcare Systems Engineering*, 3(4), 263-279.

[P14] Balasubramanian, H., Biehl, S.\*, Dai, L.\*, & Muriel, A. (2014). Dynamic allocation of same-day requests in multi-physician primary care practices in the presence of prescheduled appointments. *Health care management science*, 17(1), 31-48., [pdf](#).

[P13] Ozen, A.\*, and Balasubramanian, H., The impact of case-mix on timely access to appointments in a primary care group practice, *Health Care Management Science*. 16 (2): 101-118, 2013, [pdf](#); [spreadsheet](#)

[P12] Zhang, J., Denton, B., Balasubramanian, H., Shah, N., and Inman, B., Optimization of prostate biopsy referral decisions, *Manufacturing and Service Operations Management*, 14(4), 529-547, [pdf](#).

- [P11] Zhang, J., Denton, B., Balasubramanian, H., Shah, N., and Inman, B., Optimization of PSA screening policies: A comparison of patient and societal perspectives, *Medical Decision Making*, 2012, Mar-Apr; 32(2):337-49, [pdf](#).
- [P10] Balasubramanian, H., Muriel, A., Wang, L.\*, The impact of flexibility and capacity allocation on the performance of primary care practices, *Flexible Services and Manufacturing Journal*, 2012, 24 (4), 422-447. [pdf](#).
- [P9] Balasubramanian, H., Banerjee, R., Denton, B., Naessens, J., Wood, D., and Stahl, J., Improving clinical access and continuity using physician panel redesign, *Journal of General Internal Medicine*, 2010, 25 (10), 1109-15. ([pdf](#)).
- [P8] Denton, B., Miller, A., Balasubramanian, H., and Huschka, T., Optimal allocation of surgery blocks to operating rooms under uncertainty, *Operations Research*, 58:802:816, 2010. ([pdf](#))
- [P7] Berg, B.\*, Nelson, H., Denton, B., Balasubramanian, H., Rahman, A., Bailey, A., and Lindor, K., A discrete event simulation model to evaluate the operational performance of a colonoscopy suite, *Medical Decision Making*, 30(3), pp 380-387, 2010. ([pdf](#))
- [P6] Balasubramanian, H., Fowler, J., Keha, A. and Pfund, M., Scheduling interfering job sets on parallel machines, *European Journal of Operational Research*, 2009, 199 (1), pages 55-67 ([pdf](#))
- [P5] Pfund, M., Balasubramanian, H., Fowler, J., Mason, S., and Rose, O., A multi-criteria approach to scheduling wafer fabrication facilities, *Journal of Scheduling*, 11 (1), 2008, 29-47 ([pdf](#)).
- [P4] Mohan, S., Gopalakrishnan, M., Balasubramanian, H., and Chandrashekar, A., A lognormal approximation of activity duration in PERT using two time estimates, *Journal of the Operational Research Society*, Vol 58, Number 6, 827-831, 2007 ([pdf](#)).
- [P3] Monch, L., Balasubramanian, H., Fowler, J., and Pfund, M., Heuristic scheduling of jobs on parallel batch machines with incompatible job families and unequal ready times, *Computers and Operations Research*, Vol 32 (11), 2005, 2731-2750 ([pdf](#)).
- [P2] Balasubramanian, H., Monch, L., Fowler, J.W., and Pfund, M.E., Genetic Algorithm based scheduling of parallel batch machines with incompatible job families to minimize total weighted tardiness, *International Journal of Production Research*, Vol 42 (8), 2004 ([pdf](#)). [masters thesis]
- [P1] Ponnambalam, S., Balasubramanian, H., Kataria, M., and Gadicherla, A., A TSP-GA multi-objective algorithm for flow-shop scheduling, *International Journal of Advanced Manufacturing Technology*, Vol 23, 2004, 909-915. [undergraduate thesis]

## **B. Book chapters and Articles (students indicated with \*)**

[B1] Balasubramanian, H., Denton, B., Lin, M\*., Managing physician panels in primary care, Handbook of Healthcare Delivery Systems, CRC Press (Taylor and Francis), Editor: Yuehwen Yih, 10-1, 2011.

[B2] Balasubramanian, H., Muriel, A., Ozen, A\*., Wang, L\*., Hippchen, J\*., and Gao, X\*., Capacity allocation and flexibility in primary care", Springer Book on Healthcare Operations Management, Editor: Brian Denton, forthcoming.

[B3] Balasubramanian, H., Primary healthcare for poor nations, feature article, OR/MS Today, April 2011, Volume 38 (2), 30-34.

[B4] Balasubramanian, H., The resettlement of refugee farmers, OR/MS Today, April 2009, Volume 36 (2) (special issue on international applications of operations research).

### **C. Refereed Conference Proceedings and Extended Abstracts (students indicated with \*)**

Bryce, R\*., Eaton, M\*., Balasubramanian, H., Kosanovic, D., Solar energy system design and storage scheduling via linear techniques, broadening renewable integration, *Proceedings of ECOS 2017*.

Balasubramanian, H., Murphy, N., and Rossi, M., A conceptual model for modeling longitudinal encounter data, In *Proceedings of the 2016 Winter Simulation Conference*. IEEE Press.

Shin, S. Y\*., Brun, Y., Osterweil, L. J., Balasubramanian, H., & Henneman, P. L. (2015). Resource Specification for Prototyping Human-Intensive Systems. In *Fundamental Approaches to Software Engineering* (pp. 332-346). Springer Berlin Heidelberg

Chen, Y., Kuo, Y. H., Balasubramanian, H., & Wen, C. (2015, December). Using simulation to examine appointment overbooking schemes for a medical imaging center. In *Proceedings of the 2015 Winter Simulation Conference* (pp. 1307-1318). IEEE Press.

Alvarez Oh\*, H-J, Muriel, A., and Balasubramanian, H., A user-friendly Excel simulation for scheduling in primary care practices, In *Proceedings of the 2014 Winter Simulation Conference*. IEEE Press.

Ozen, A\*., Balasubramanian, H., Samra, P., Ehresman, M., Li, H., Fairman, T., and Roche, J., The impact of hourly discharge rates and prioritization on timely access to inpatient beds, In *Proceedings of the 2014 Winter Simulation Conference*. IEEE Press.

Seung Yeob Shin\*, Hari Balasubramanian, Yuriy Brun, Philip L. Henneman, and Leon J. Osterweil, Resource Scheduling through Resource-Aware Simulation of Emergency Departments, in *Proceedings of the 5th International Workshop on Software Engineering in Health Care (SEHC13)*, 2013, pp. 64–70.

Beck, E.\*, Balasubramanian, H., Henneman, P., (2009), Resource management and process change in a simplified model of an emergency department. *Proceedings of the Winter Simulation Conference*, Austin 2010.

Balasubramanian, H., Banerjee, R., Gregg, M., and Denton, B. (2007), Improving primary care access using simulation optimization. *Proceedings of the Winter Simulation Conference*, Washington DC, pp. 1494-1500.

## **VI. SERVICE**

### **Service to University and Department**

1. Systems Engineering Committee (2010 – 2011)
2. Graduate Admissions Committee (2009-2010; 2012-2013, 2015-2016)
3. Communications Committee (2010-2011)
4. Departmental Personnel Committee (2010-2011, 2015-2016, 2016-2017)
5. New student advisor for freshman orientation (2010, 2011)
6. Open house presenter (all years since 2008)
7. Freshman advising in the summer (2010, 2012, 2013)

### **Service to the Research Community**

1. **Area Editor (AE)** of the Health department of the journal *IIE Transactions* (Jan 2013-present) and *Service Science* (Fall 2016 to present). **Department Editor (DE)**, Healthcare Operations Research, *IISE-Transactions in Health Systems Engineering*
2. **Judge** on the **Pierskalla Award** for Best Healthcare Paper organized by the INFORMS Health Applications Society (HAS) (2013).
3. **Panelist for the National Science Foundation:** 2009 (December), 2010 (December), 2012 (May and December), and 2013 (August).
4. **Program Chair**, INFORMS Healthcare Conference, Chicago (June 2013).
5. **Co-Chair** of the Health Operations Management Track at the Production and Operations Management Society (POMS) Society Annual Conference, Denver, 2013.
6. **General Chair, INFORMS Northeast Regional Conference (May 2011)**
7. **Ad hoc Reviewer** for the principal peer reviewed journals in operations research and management science: *Operations Research*, *IIE Transactions*, *Manufacturing and Service Operations Management*, *IIE Transactions on Health Systems Engineering*, *Health Care Management Science*, *Interfaces*, *Computers and Operations Research*, *Computers and Industrial Engineering*, *Journal of the Operations Research Society*.

