

SeungBeum Chris Suh

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EDUCATION

- AUG 2012 Virginia Tech, Blacksburg, VA
- JUNE 2017 Ph.D., Mechanical Engineering
- Dissertation: Development and Characterization of Bacteria-Based Drug Delivery Systems for Cancer Therapy
- Advisor: Professor Bahareh Behkam
- Committee members: Professors N. Dervisis, N. Rylander, B. Scharf, D. Tafti
- SEP 2006 University of Michigan, Ann Arbor, MI
- DEC 2007 M. S., Mechanical Engineering
- Focus: Dynamics and Control, Image Processing
- Independent Research: Longitudinal Control Design for Adaptive Cruise implemented vehicle platoon
- Advisor: Professor Huei Peng
- SEP 2003 University of California, San Diego, CA
- AUG 2006 B. S., Mechanical and Aerospace Engineering
- Focus: Control systems, Dynamic systems, Design, and Robotics

WORK EXPERIENCE:

- 2017 - Present Research Scientist at Korea Institute of Science & Technology, Robotics & Media Institute, Center for Medical Robotics
- 2012 - 2017 Virginia Tech (Ph.D., Mechanical Engineering) in the field of Drug Delivery System for Cancer Research at MicroN BASE Laboratory
- 2008 -2011 Research Scientist at Korea Institute of Science & Technology, Biomedical research institute, Center for Bionics

RESEARCH PROJECTS:

2018-2019	표적물질 기반 형광유도 및 정밀수술 로봇 원천기술 개발 증강 영상 기반 스마트 수술 로봇 기술 개발
2017	Development of Walk Assist Robotic System 개방형 수술로봇 플랫폼에 기반한 차세대 미세수술로봇 개발 및 실용화
2012-2017	Bacterial Chemotaxis Enabled Autonomous Sorting of Nanoparticles of comparable sizes. Chemotaxis study of Salmonella Typhimurium mutants in diffusion based hydrogel device. NANOBEADS (Nanoscale Bacteria-Enabled Autonomous Drug Delivery Systems) for the Intratumoral Transport Release mechanism of Drug-loading bacterial vesicle Tumor colonization mechanism based on bacterial chemotaxis, motility, and proliferation
2008-2011	미세수술용 내시경 로봇 및 시스템 통합 한국형 위험물 탐지 로봇 시스템 개발 실외환경에 강인한 도로기반 저가형 자율주행기술 개발 화재감시를 위한 원격 순찰로봇 개발

PUBLICATIONS:

Journal Article

- **Suh, S.**, Jo, A., Traore, M. A., Zhan, Y., Coutermarsh-Ott, S. L., Ringel-Scaia, V. M., Behkam, B.. “Nanoscale Bacteria-Enabled Autonomous Drug Delivery System (NanoBEADS) Enhances Intratumoral Transport of Nanomedicine.” *Advanced Science*, 1801309, (2018).
- **Suh, S.**, Broadway, K. M., Behkam, B., & Scharf, B. E. “Optimizing the restored chemotactic behavior of anticancer agent Salmonella enterica serovar Typhimurium VNP20009.” *Journal of Biotechnology*, 251, 76–83, (2017).
- **S. Suh**, M. A. Traore, and B. Behkam, “Bacterial Chemotaxis Enabled Autonomous Sorting of Nanoparticles of comparable sizes,” *Lab Chip*, 16, 1254-1260, (2016).
- Yeonsik Kang, Chiwon Roh, **SeungBeum Suh**, Bongsob Song, “A Lidar-Basded Decision-Making Method for Road Boundary Detection Using Multiple Kalman Filters”, *IEEE Transactions on Industrial Electronics*, 4360-4368 (2012)
- **SeungBeum Suh**, Yeonsik Kang, “A Robust Lane Recognition Technique for Vision-based Navigation with a Multiple Clue-Based Filtration Algorithm,” *International Journal of Control, Automation and Systems*, 348-357 (2011)
- Changmook Chun, **SeungBeum Suh**, Sanghoon Lee, Chiwon Roh, SungChol Kang , Yeonsik Kang,

“Autonomous Navigation of KUVe(Kist Unmanned Vehicle Electric)”, Journal of Institute of Control, Robotics and System Engineering, 16: 617-624 (2010)

- **SeungBeum Suh**, Yeonsik Kang, Chiwon Roh, SungChol Kang, “Experiments of Urban Autonomous Navigation using Lane Tracking control with Monocular Vision”, Journal of Institute of Control, Robotics and System Engineering, 480-487 (2009)

Conference proceedings

- **SeungBeum Suh**, Eric Leaman, Ying Zhan, Bahareh Behkam, “Mathematical Modeling of Bacteria-Enabled Drug Delivery System Penetration into Multicellular Tumor Spheroids”, IEEE Engineering in Medicine and Biology Society, 2018.07
- Seung-Won Kim, Jiyeon Song, **SeungBeum Suh**, Woosub Lee, Sungchul Kang, “Design and Experiment of a Passive Sit-To-Stand and Walking (STSW) Assistance Device for the Elderly”, IEEE Engineering in Medicine and Biology Society, 2018.07
- Seong Pal Kang, Junho Choi, **Seung-Beum Suh**, Sungchul Kang, “Design of mine detection robot for Korean mine field”, IEEE Workshop on Advanced Robotics and its Social Impacts, 2010.10
- Changmook Chun, Taebum Kwon, **SeungBeum Suh**, SungChol Kang, “Autonomous Urban Navigation and its Application to Patrol”, IEEE Workshop on Advanced Robotics and its Social Impacts, 2010.10
- Changmook Chun, **SeungBeum Suh**, Chiwon Roh, Yeonsik Kang, SungChol Kang, “Sensor Fusion-Based Line Detection for Unmanned Navigation”, IEEE Intelligent Vehicles Symposium, 2010.06
- **SeungBeum Suh**, Yeonsik Kang, Chiwon Roh, SungChol Kang, “Robust Lane Recognition Technique for Vision-Based Navigation with Multiple Detection Clues”, International Conference on Ubiquitous Robotics and Ambient Intelligence, 2009.10
- **SeungBeum Suh**, Yeonsik Kang, Chiwon Roh, ChulDong Sim, SungChol Kang, “Development of Autonomous patrol robot for fire-watch in Urban Environment”, Korea Robot Association conference, 2009.08
- **SeungBeum Suh**, Yeonsik Kang, Chiwon Roh, SungChol Kang, “Experiments of Autonomous Lane Tracking Control Using Monocular Camera,” International Conference on Ubiquitous Robotics and Ambient Intelligence, 2008.11

Book Chapter

- Leaman, Eric J., **SeungBeum Suh**, and Bahareh Behkam. "NANOSCALE BACTERIA-ENABLED AUTONOMOUS DELIVERY SYSTEMS (NanoBEADS) FOR CANCER THERAPY," The Encyclopedia of Medical Robotics, 87-109, 2018
- **SeungBeum Suh**, JunHo Choi, ChangHyun Cho, YeonSub Jin, Seung-Yeup Hyun, Sungchul Kang, “Mine detecting robot system,” Field and Service Robotics, 97-109, 2014

Presentation at Professional Society Meetings

- Ami Jo, **SeungBeum Suh**, Bahareh Behkam, and Richey M. Davis, "Fabrication and Characterization of PLGA Nanoparticle-Bacteria Conjugate NanoBEADS for increased tumor penetration", GSA 2016
- Mahama A. Traore, **SeungBeum Suh** and Bahareh Behkam, "A Chemotaxis based Microfluidic Sorting Platform", BMES 2014

PATENTS:

- Detection of Road Line using Both Laser Reflectivity and Vision, Korea Pub, 2010-0073391, 2010.07.29
- Robot for Landmine Detection, Korea Pub, 2011-0117430, 2011.11.11
- Device for generating limit torque with function of real-time yielding torque changing, Korea Pub, Submitted

PROFESSIONAL ASSOCIATIONS:

- Student member of IEEE (Institute of Electrical and Electronic Engineers)
- Student member of ASME (American Society of Mechanical Engineers)
- Student member of BMES (Biomedical Engineering Society)

AWARDS AND HONORS:

- Young Scientist Fellowship from Korea Institute of Science and Technology, 2012
- Ranked 1st in the Ph.D. qualifying exam, Spring 2013
- Hord Fellowship from Mechanical Engineering Department for one full academic year, 2014