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- 2. Designation** : Assistant professor
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- 4. Institution** : Indian Institute of Technology Patna
- 5. Gender** : Male
- 6. Specialization** : Robotics, Virtual Reality, CAD/CAM

### 7. Academic Qualifications

	Degree	Month/Year	Subject	University/Institution
1	Bachelor of Engineering (B.E.)	August/2003	Production Engineering	University of Mumbai
2	Master of Technology (M-Tech.)	August/2006	Manufacturing Engineering	Indian Institute of Technology Bombay, Mumbai
3	Doctor of Philosophy (Ph.D.)	August/2011	Mechanical Engineering	University of Maryland, College Park

### 8. Ph.D. Thesis details

Title: Physics-Aware Model Simplification for Interactive Virtual Environments  
Field/domain: Virtual Reality, Robotics and CAD/CAM  
Supervisor: Prof. Satyandra K. Gupta  
University: University of Maryland, College Park  
Year of Award: 2011

### 9. Professional Experience

Sr. No.	Positions held	Name of the Organization	From	To
1	Assistant Professor	Indian Institute of Technology Patna	September, 2012	Continuing
2	Postdoctoral	University of Maryland, College	September, 2011	August, 2012

	Research Associate	Park		
3	Design Engineer	General Electric, Bangalore Technology Center	August 2006	June 2007

#### 10. Awards and Recognition

Sr. No.	Name of the Award / Fellowship	Awarding Agency	Year
1	2013 ASME Computers and Information in Engineering Division's Best Dissertation Award.	American Society of Mechanical Engineers (ASME)	2013
2	Computer-Aided Design 2012 most cited paper award for the article "Survey of CAD model simplification techniques for physics-based simulation applications"	Elsevier	2012
3	2012 NSF travel award to present research poster at Performance Metrics for Intelligent Systems (PerMIS'2012)	National Science Foundation (NSF), USA	2012
4	A. James Clark Graduate School Fellowship	University of Maryland, College Park	2007-2009
5	General Electric Night on the Town Award	General Electric, Bangalore Technology Center	2007

#### 11. Publications

##### Journal Publications

J.11. Gundupalli, S., P., Hait, S., and Thakur, A., Classification of metallic and non-metallic fractions of e-waste using thermal imaging-based technique Article reference, Process Safety and Environmental Protection Corresponding, 118:32-39, 2018. **Impact factor = 3.441**

J.10. Jakhar, K., Chattopadhyay, A., Thakur, A., and Raj, R., Spline Based Shape Prediction and Analysis of Uniformly Rotating Sessile and Pendant Droplets, Langmuir, 33(22):5603-5612, 2017. **Impact factor = 3.789**

J.9. Gundupalli, S., P., Hait, S., and Thakur, A., Multi-material classification of dry recyclables from municipal solid waste based on thermal imaging, Waste Management, 70:13-21, 2017. **Impact factor = 4.03**

J.9. Gundupalli, S., P., Hait, S., and Thakur, A., A review on automated sorting of source-separated municipal solid waste for recycling, Waste Management, 60:56-74, 2017. **Impact factor = 3.829.**

J.8. Raj, A., and Thakur, A., Fish-inspired robots: design, sensing, actuation, and autonomy—a review of research. Bioinspiration & Biomimetics, 11(3):dx.doi.org/10.1088/1748-3190/11/3/031001, 2016. **Impact factor = 4.03**

J.7. Thakur, A., Chowdhury, S., Švec, P., Wang, C., Losert, W., and Gupta, S., K., Indirect pushing based automated micromanipulation of biological cells using optical tweezers. *International Journal of Robotics Research*, 33(8):1098-1111, 2014. **Impact factor = 2.863**

J.6. Chowdhury, S., Thakur, A., Švec, P., Wang, C., Losert, W., and Gupta, S., K., Automated Manipulation of Biological Cells Using Gripper Formations Controlled By Optical Tweezers, *IEEE Transactions on Automation Science and Engineering*, 11(2), 338-347, 2014. **Impact factor = 2.162**

J.5. Švec, P., Thakur, A., Raboin, E., Shah, B., C., and Gupta, S., K., Target Following with Motion Prediction for Unmanned Surface Vehicle Operating in Cluttered Environments. *Autonomous Robots*, 36(4), 383-405, 2014. **Impact factor = 1.750**

J.4. Thakur, A., Švec, P., Gupta, S., K., GPU based generation of state transition models using simulations for unmanned surface vehicle trajectory planning. *Robotics and Autonomous Systems*, 60(12), 1457-1471, 2012. **Impact factor = 1.105**

J.3. Thakur, A., Gupta, S., K., Improving performance of rigid body dynamics simulation by removing inaccessible regions from geometric models. *Computer-Aided Design*, 44(12), 1190-1204, 2012. **Impact factor = 1.515**

J.2. Thakur, A., and Gupta, S., K., Real-time dynamics simulation of unmanned sea surface vehicle for virtual environments. *Journal of Computing and Information Science in Engineering*, 11(3), 2-11, 2011. **Impact factor = 0.690**

J.1. Thakur, A., Banerjee, A., G., Gupta, S., K., A survey of CAD model simplification techniques for physics-based simulation applications. *Computer-Aided Design*, (41):2, 65-80, 2009. **Impact factor = 1.515**

#### Peer-Reviewed Conference Publications

C.25. Thati, S., Raj, A., and Thakur, A., Optimal and dynamically feasible path planning for an anguilliform fish-inspired robot in presence of obstacles. *ASME Mechanisms and Robotics Conference*, Quebec City, Canada, August 26-29, 2018. (Accepted)

C.24. Agrawal, K., Jain, K., Gupta, D., Shrivastav, R., Agnihotri, A., and Thakur, A., Bayesian optimization based terrestrial gait tuning for an 12-dof alligator-inspired robot with active body undulation. *ASME Mechanisms and Robotics Conference*, Quebec City, Canada, August 26-29, 2018. (Accepted)

C.23. Raj, A., Kumar, A., and Thakur, A., Automated Locomotion Parameter Tuning for an Anguilliform-inspired Robot. In *Systems, Man, and Cybernetics*, 2016 IEEE International Conference on, Budapest, Hungary, October 9-12, 2016.

C.22. Paulraj, S.G., Hait, S., and Thakur, A., Automated municipal solid waste sorting for recycling using a mobile manipulator, 40th International Conference on Mechanisms and Robotics (MR) at 2016 ASME-IDETC, Charlotte, NC, USA, August 21-24, 2016.

C.21. Kulkarni, P., Kumar, A., Thakur, A., D., and Thakur, A., Automated non-prehensile magnetic micromanipulation in presence of spatially varying flow field, 10th International Conference on Micro- and Nanosystems (MNS) at 2016 ASME-IDETC, Charlotte, NC, USA, August 21-24, 2016.

- C.20. Shah, B., C., Švec, P., Thakur, A., and Gupta. S., K., Path Planning for Unmanned Vehicles Operating in Time-Varying Flow Fields. ICAPS Workshop on Planning and Robotics (PlanRob 2016), London, UK, June 13-14, 2016. (Accepted)
- C.19. Sathish, G.P., and Thakur, A., Automated Municipal Solid Waste Sorting for Recycling using a Mobile Manipulator, 40th Mechanisms and Robotics Conference (MR), ASME-IDETC, Charlotte, UNC, USA, August 21-24, 2016. (Accepted)
- C.18. Das, A., Thakur, A., D., and Thakur, A., Image guided automated non-prehensile magnetic micromanipulation of cells, 9th International Conference on Micro- and Nanosystems (MNS) at 2015 ASME-IDETC, Boston, MA, USA, August 2-5, 2015.
- C.17. Shriyam, S., Mishra, A., Nayak, D., and Thakur, A., Design, fabrication and gait planning of alligator-inspired robot, International Conference on Advances in Mechanical Sciences, Hyderabad, AP, India, January 9-11, 2014.
- C.16. Chowdhury, S., Thakur, A., Švec, P., Wang, C., Losert, W., and Gupta, S., K., Enhancing range of transport in optical tweezers assisted microfluidic chambers using automated stage motion. ASME International Conference on Micro and Nanosystems, Portland, Oregon, August 4-7, 2013.
- C.15. Chowdhury, S., Thakur, A., Wang, C., Švec, P., Losert, W., and Gupta. S., K., Automated indirect manipulation of irregular shaped cells with optical tweezers for studying collective cell migration. IEEE International Conference on Robotics and Automation (ICRA '13), Karlsruhe, Germany, May 6-10, 2013.
- C.14. Thakur, A., Chowdhury, S., Švec, P., Wang, C., Losert, W., and Gupta, S., K., Automated indirect optical micromanipulation of biological cells using indirect pushing for minimizing photo-damage. ASME International Conference on Micro and Nanosystems, Chicago, Illinois, August 12 -15, 2012.
- C.13. Švec, P., Thakur, A., Shah, B., C., and Gupta. S., K., USV trajectory planning for time varying motion goals in an environment with obstacles. ASME Mechanism and Robotics Conference, Chicago, Illinois, August 12-15, 2012.
- C.12. Chowdhury, S., Thakur, A., Wang, C., Švec, P., Losert, W., Gupta, S., K., Automated indirect transport of biological cells using planar gripper formations. IEEE International Conference on Automation Science and Engineering (CASE 2012), Seoul, Korea, August 20-24, 2012.
- C.11. Švec, P., Schwartz, M., Thakur, A., and Gupta, S., K., Trajectory planning with look-ahead for unmanned sea surface vehicles to handle environmental disturbances. In Intelligent Robots and Systems (IROS), 2011 IEEE/RSJ International Conference on, San Francisco, California, September 25-30, 2011.
- C.10. Thakur, A., Švec, P., and Gupta, S., K., Generation of state transition model using simulation for unmanned sea surface vehicle trajectory planning. ASME Mechanisms and Robotics Conference, Washington DC, August 28-31, 2011.
- C.9. Thakur, A., Gupta, S., K., A computational framework for real-time unmanned sea surface vehicle motion simulation. ASME Computers in Engineering Conference. Montreal, Canada, August 15-18, 2010.

C.8. Gupta, S., K., Anand, D., K., Thakur, A., Švec, P., and Schwartz, M., A simulation based framework for discovering planning logic for Unmanned Surface Vehicles. ASME Engineering Systems Design and Analysis Conference, Istanbul, Turkey, July 12-14, 2010.

C.7. Schwartz, M., Švec, P., Thakur, A., and Gupta, S., K., Evaluation of automatically generated reactive planning logic for unmanned surface vehicles. Performance Metrics for Intelligent Systems Workshop September 21 - 23, Gaithersburg, Maryland, September 2009.

C.6. Thakur, A., Gupta, S., K., Context dependent contact preserving off-line model simplification for interactive rigid body dynamics simulations. ASME Computers and Information in Engineering Conference, San Diego, August 30-September 2, 2009.

C.5. Thakur, A., Gupta, S., K., Anand, D., K., Brough, J., E., Kavetsky, R., A., and Schwartz, M., A survey of the virtual environments-based assembly training applications. Proceedings of Virtual Manufacturing Workshop, Turin, Italy, October 7-8, 2008.

C.4. Pavanaskar, S., S., Thakur, A., Sunil, V., B., and Pande, S., S., WebNC: An internet based system for global product development. Proceedings of 7th Global Conference on Sustainable Manufacturing, 2009, Chennai, India, December 1-4.

C.3. Thakur, A., S., S., Pande, A web based system for sheet metal modeling and process planning, Proceedings of 1st International and 22nd All India Conference on All India Manufacturing Technology Design and Research, 2006, Roorkee, India, December 21-26.

C.2. Thakur, A., Pande, S., S., SIBAM: A web based feature modeler for sheet metal components. Proceedings of 22nd International Conference on CAD/CAM, Robotics and Factories of future, Vellore, India, July 19-23, 2006.

C.1. Pavanaskar, S., S., Thakur, A., Sunil, V., B., and Pande, S., S., FBMod: A web based feature modeler for prismatic components, Proceedings of the National Conference on Design for Product Cycle (DPLC-2006), Pilani, India, February 17 - 18, 2006.

## **12. Details of Patents**

Raj, R., **Thakur, A.**, Banerjee, S., Pandey, U., "System and Method for Boiling-Based Underwater Buoyancy Control," *Application filing in process*

## **13. Book Chapter**

B.1. Schwartz, M., Svec, P., Thakur, A., and Gupta, S. K., Simulation based synthesis of planning logic for autonomous unmanned sea surface vehicles. Simulation Driven Innovation and Discovery, Energetics Applications, CALCE EPSC Press, College Park, 2011.

## **14. Sponsored Project**

### R&D Projects

1. Project Title: Robust Motion Planning for Amphibious-Inspired Robots  
Sponsor: Department of Science and Technology, Government of India

Project Cost: Rs. 17.81 lakh  
PI/CoPI: PI  
Duration: 2013 – 2016  
Present Status: Completed

2. Project Title: Development of Low Cost, Efficient, Mechanism for Collection of Garbage and Dirt for Municipal Corporations, Panchayats  
Sponsor: Swachta Action Plan, MHRD  
Project Cost: Rs. 16.71 lakh  
Duration: 2018 – 2021  
Present Status: Ongoing

#### Consultancy Work

1. Project Title: Preparation of Detailed Project Report for Central for Robotics Center and Central Instrumentation Facility  
Sponsor : Department of Science and Technology, Government of Bihar  
Project Cost: Rs. 3.25 lakh  
Duration: 2016 – 2018  
Present Status: Completed
  
2. Project Title: Design, Fabrication and Installation of Motorized Sliding Security Gate at Reserve Bank of India, Patna  
Sponsor : Reserve Bank of India, Patna  
Project Cost: Rs. 3.52 lakh  
Duration: 2018  
Present Status: Ongoing