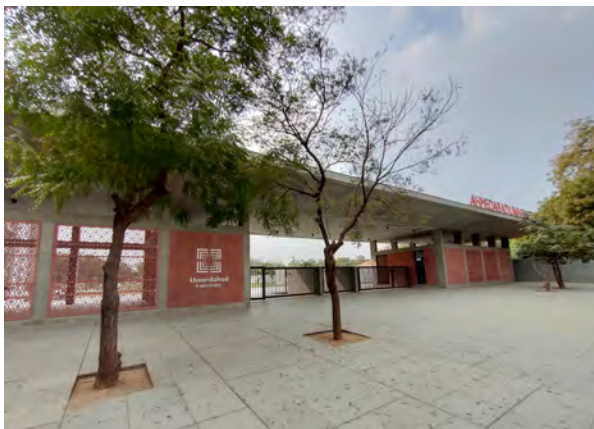


RESEARCH HORIZONS

The Official Newsletter of the University Grants Office



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IN CONVERSATION WITH DHAVAL PATEL



Dhaval Patel is Assistant Professor at the School of Engineering and Applied Science and currently leads two major international collaborative research projects on 5G Wireless Networks and Cyberphysical Systems, respectively. We spoke to him about his research, the funding support and working with international collaborators. Excerpts from the conversation.

Please could you tell us about your two collaborative projects?

Our work on 5G systems is in collaboration with Miguel Lopez-Benitez, at the University of Liverpool, UK and is supported by a DST-UKIERI grant. The key objective of this project is to develop a smart sensing framework such that the unlicensed user (like Wi-Fi) can efficiently transmit in a licensed band (eg. GSM), with some interference limit. This leads to an efficient usage of spectrum and wireless network capacity can be expanded. The grant provides funds both for mobility of project partners and for research. This work is now in the final phase of completion. We have already completed six visits on either side, published in several reputed journals and international conferences and also organized three national faculty development programs at Ahmedabad University.

Our work on Cyberphysical Systems is more recent and is supported by a DST-ASEAN grant that brings together 5 collaborators from 3 countries. From a technology perspective, if we could provide the right information at the right place, would it help avoid situations such as traffic congestion? Could two vehicles communicate with each other in real-time? We apply Machine Learning algorithms both on synthetic traffic data and on real empirical traffic data. We are working to improve our simulations and this could offer low-cost solutions for the vehicular industry in India.

How did the collaboration on vehicular systems fall in place?

Two years ago, I attended a conference in the USA, which was focused on Vehicular Technology. While at the conference, I met Guan Yong Liang and Sumei Sun from Singapore and we had discussions on extending our current work together in the context of vehicular systems. Vehicular density is high in all Asian countries. Singapore has implemented Intelligent Traffic Systems (ITS), where two vehicles can “communicate” with each other and maintain a certain distance.

I knew that the Indian Government was investing a lot of funding in Cyberphysical systems and the DST-ASEAN call seemed like the right place for us to focus. Here, the Indian PI is the key contributor and has to connect with two other member state partners from the ASEAN countries. Our team included two colleagues from Singapore, two from Malaysia and of course my group from India. We all decided to write a proposal together and it took us nearly 9 months of exchanging emails and sharing drafts before we were ready to submit our grant application.

It has taken us time to learn to work effectively with each other. An additional challenge is, that unlike the DST-UKIERI grant, the DST-ASEAN grant only provides mobility funds. Funds for research still need to be made available from other sources. Nevertheless, this has allowed us to travel between the collaborating institutions.

IN CONVERSATION WITH DHAVAL PATEL

What are some of the challenges in driving such research into outcomes relevant to society?

It is important to convert the research we are doing into societal benefit. With our algorithms, we are trying to solve the latency problem wherein there is a delay in vehicles receiving messages about traffic. We are aiming to provide the right kind of resources which will allow one vehicle to connect with other vehicles and with backbone infrastructure for rapid data transfer. This will allow the driver of the vehicle to process the data and take a decision accordingly.

Society level conversion of technology is important but is a different challenge. My collaborators in Singapore have an army of lawyers to help them navigate the patenting requirements in a short time span. Here in India too, we need such an ecosystem. This is a time-consuming process and it would be great to have that kind of support.

What does this collaboration mean for the students training in your laboratory?

One of my students is currently in Singapore and this is a great learning opportunity for him. I am happy that my student can get such good exposure. I have tried to develop my own ecosystem here and a process for training my students. I have worked with undergraduate students through the Undergraduate Research Program of the University. My students, both at undergraduate and post-graduate levels, immediately get the benefit of these international collaborations.

About the collaborations:

The collaboration on “Non-parametric Smart Sensing Analytics based on Large Spectrum Data and Estimation of Channel Activity Statistics” is supported by a prestigious DST- U.K India Education and research Initiative (UKIERI) grant awarded to Dhaval Patel, Ahmedabad University along with Miguel Lopez Benitez, University of Liverpool, U.K

More information on UKIERI can be accessed at <http://www.ukieri.org/>

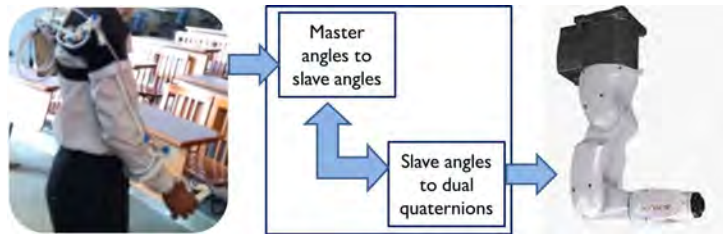
The collaboration on “Cognitive Radio Enabled Vehicular Cyber Physical System for Urban Area” is supported by a DST-ASEAN grant awarded to Dhaval Patel, Ahmedabad University along with Guan Yong Liang, Nanyang Technological University Singapore; Sumei Sun, Institute for Infocomm Research Singapore; Chang Yoong Choon, Universiti Tunku Abdul Rahman, Malaysia and Joanne Lim, Monash University Malaysia.

More information on the AISTDF can be accessed at (<https://aistic.gov.in/ASEAN/aistdfCollaborative>).



QUATERNION BASED LEADER-FOLLOWER ROBUST TRACKING CONTROL OF AN INDUSTRIAL ROBOT USING AN ANTHROPOMORPHIC ARM

Project report by Harshal Oza



Remote Dexterous Leader-Follower Control of Industrial Robots

Summary:

Industrial and service robotics industry in its present form faces new challenges not only due to the ever increasing demands of productivity and safety from its users but also from the fact that robots of today are expected to work cooperatively with human beings. In the age of humanoid robots, it is natural to expect that high end human assisted teaching of industrial robots should be possible for advanced manufacturing tasks. However, such a technology is neither widespread nor easily available. The effort of the operator becomes cumbersome when interacting with a robot due to two or three dimensional devices (such as joy stick or an electronic pendant) which have limited spatial freedom when compared to the dexterity of the robot thereby affecting the efficiency of teaching and in turn productivity. The rationale of this project lies in the need to leverage the existing knowledge and to develop an intuitive yet robust technology for remote operation of an industrial robot. This is a complex task when remote control of a robot is studied. Given the potential of quaternion based approach in mitigating the kinematic singularities of the robot orientation, this project identifies opportunities for a comprehensive research framework for the use of a wearable anthropomorphic arm for remote leader-follower control of industrial robots. The principal motivation is in developing a safe and robust remote control technology for operators of industrial robotics with a potential to develop solutions for hazardous area applications. The outcomes of the proposed research solve open theoretical problems such as finite time stability of quaternion based dynamics and give technological solution for dexterous and safe remote control of industrial robots.

Current outcomes:

There have been three international conference publications from the project as follows:

1. K. Singh and H. Oza, "Second order sliding mode control using unit dual-quaternion dynamics with application to robotics", in the proceedings of the 15th International Workshop on Variable Structure Systems (VSS), Graz, Austria, July 2018.
2. H. Prajapati, K. Singh and H. Oza, "Dual Quaternion Based Finite-Time Control with Application to Remote Dexterous Control of Articulated Robots", in the proceedings of the 15th IEEE India Council International Conference (INDICON 2018), Coimbatore, India, December 2018.
3. H. Oza and Y. Orlov, "Robust and Optimal Control of Systems With Time Varying Unilateral Constraints Using Non-smooth Transformation", accepted for publication in the proceedings of the 58th IEEE Conference on Decision and Control (IEEE-CDC), Nice, France, December 2019.

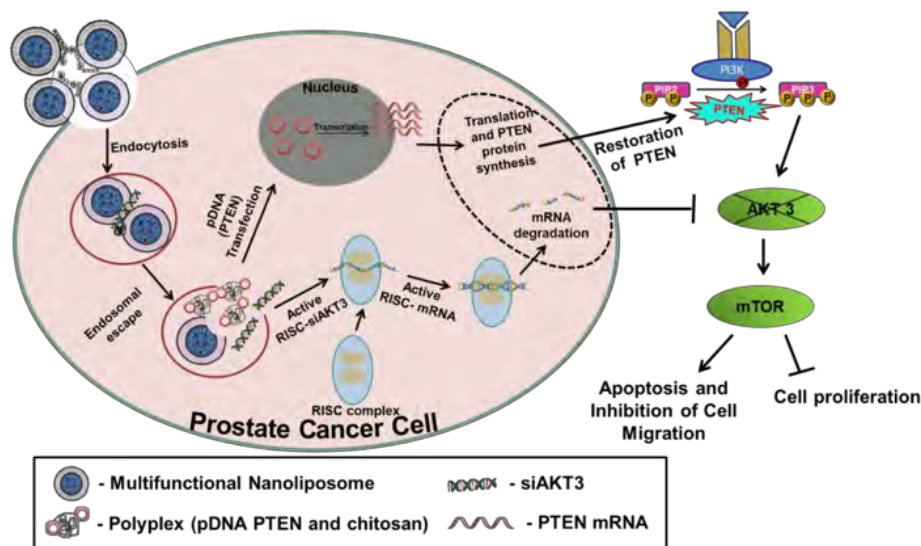
Future directions:

Long Term: The results from this project provide new technology in the area of remote control of industrial robots. Such technology exists in the area of healthcare but does not exist in a typical manufacturing set-up where robots are employed. Applications such as under-water maintenance and remotely operated fire rescue will benefit from the outcomes of the project. **Immediate:** The research work can pave the way for technology transfer to industry once the fifth objective is achieved. PI is in touch with a few industry personnel to study how best this concept can be tailored to industrial applications.

Harshal Oza is Assistant Professor at the School of Engineering and Applied Science with research interests in the application of control systems theory in industrial automation, robotics and aerospace engineering. This project was supported by the Science and Engineering Research Board (SERB).

MULTI-TARGET ANTIOXIDANT NANOCONSTRUCT FOR PROSTATE CANCER TREATMENT

Project report by Sanjay Singh



Schematic diagram showing the anticancer effect of the developed multifunctional nanoliposomes, mediated by restoration of PTEN expression and inhibition of AKT3 protein expression leading to cancer cell apoptosis. Antioxidant nanoceria decrease the cellular free radical levels to further arrest the growth of prostate cancer cells.

Summary:

In this project, we hypothesized to develop a multifunctional nanoliposome system for simultaneous delivery of cerium oxide nanoparticles (nanoceria) and two anticancer agents (PTEN plasmids and AKT3 siRNAs) into prostate cancer cells. Nanoceria has recently been discovered as a free radical scavenger, and examined for its anticancer effect on various experimental cancer model types which are mainly caused by an excess of free radicals. Cancer cells are known to exhibit elevated levels of free radicals, which are responsible for the deregulation of cellular pathways. PTEN gene loss (reduced PTEN expression) has been shown to be associated with prostate cancer tumour aggression. Recent studies have also demonstrated that PTEN transfection leads to reduced tumour growth. The GFP (Green Fluorescent Protein) tagged PTEN plasmids enable easy tracking of the cells exposed to the nanoparticle treatment and monitor the restored expression of PTEN in cancer cells, under ex vivo conditions. Additionally, high level expression of AKT3 has been also found in prostate cancer cells, which can be corrected by using corresponding siRNAs (AKT3-siRNA). Since mono-therapeutic agency systems for cancer treatment is failing largely in the clinics, multiple anti-cancer agents are needed to simultaneously, cooperatively and independently target multiple pathways of cancer progression. For this purpose, a carrier system is required which would efficiently carry and deliver multiple anticancer agents to the desired site.

In this project, we have synthesized a multifunctional nanoliposomal formulation incorporating PTEN plasmid, AKT3 siRNA, and antioxidant cerium oxide nanoparticles (CeNPs). The nanoliposomes were able to successfully internalize in prostate cancer (PC-3) cells, restored the expression of PTEN protein and knock down AKT3 mRNA. Further, the multifunctional nanoliposomes induce DNA damage and apoptosis in prostate cancer cells. Investigation of the PI3K/AKT/mTOR signaling pathway revealed that PTEN protein and apoptosis specific proteins are overexpressed, thus causing the inhibition of oncoproteins, thus, prostate cancer.

MULTI-TARGET ANTIOXIDANT NANOCONSTRUCT FOR PROSTATE CANCER TREATMENT

Project report by Sanjay Singh

Outcomes:

The research work supported from this project are published (selected) as:

- Singh, S., (2016) Cerium Oxide Based Nanozyme: Redox Phenomenon at Biointerfaces, *Biointerfaces*, 11, 04B202
- Singh, R., Karakoti, A., Self, W., Seal, S., Singh S. (2016) Redox-sensitive cerium oxide nanoparticles protect human keratinocytes from oxidative stress induced by glutathione depletion, *Langmuir*, 32(46), 12202-12211
- Vallabani, NVS., Karakoti, A., Singh, S., (2017) ATP-mediated intrinsic peroxidase-like activity of FE₃O₄-based nanozyme: One step detection of blood glucose at physiological pH, *Colloids and Surfaces B: Biointerfaces*, 153, 52-60
- Shah, J., Singh, S. (2018) Unveiling the Role of ATP in Amplification of Artificial Peroxidase Activity of Gold Nanoparticles: A Surface Charge Effect, *3Biotech*, 8(1), 67
- Bhagat, S., Vallabani, NVS., Shuttanandan, V., Bowden, M., Karakoti, A., Singh, S. (2018) Gold core/ceria shell-based redox active nanozyme mimicking the biological multienzyme complex phenomenon, *Journal of Colloid and Interface Science*, 513, 831-842
- Singh, S., Asal, R., Bhagat, S. (2018) Multifunctional antioxidant nanoliposomes-mediated delivery of PTEN plasmids restore the expression of tumor suppressor protein and induce apoptosis in prostate cancer cells, *Journal of Biomedical Materials Research: Part A*, 12, 3152-3164
- Singh, R., Singh, S. (2019) Redox-dependent catalase mimetic cerium oxide-based nanozyme protect human hepatic cells from 3-AT induced acatalasemia, *Colloids and Surfaces B: Biointerfaces*, 175:625-635
- Vallabani, NVS., Singh, S., Karakoti, A. (2019) Investigating the Role of ATP towards Amplified Peroxidase Activity of Iron Oxide Nanoparticles in Different Biologically Relevant Buffers, *Applied Surface Science*, 492, 337-348
- Jain, V., Bhagat, S., Singh, M., Bansal, V., Singh, S. (2019) Unveiling the effect of 11-MUA coating on biocompatibility and catalytic activity of Gold-core Cerium oxide-shell-based nanozyme, *RSC Advances*, 9,33195

Future prospects:

- The developed multifunctional nanoliposomes showed excellent results, under in vitro experimental conditions, towards the inhibition of prostate cancer cell culture models. Therefore, it would be interesting to study their in vivo success in mouse and other suitable animal models.
- Utilizing the methods used in this project, other anticancer nanoliposomes could also be developed for other cancer types. The nanoliposomes could be modulated as per the requirement of the disease type and therefore, can be extended for other diseases as well which are caused by the excess of free radicals.

Sanjay Singh is Associate Professor at the School of Arts and Sciences with research interests in Nanoscience and Nanobiotechnology. This project was supported by the Science and Engineering Research Board (SERB).

EDUCATIONAL TRANSFORMATIONS AND SOCIETAL CHANGE IN LIBERALIZING INDIA

Workshop report by Leya Mathew and Mary Ann Chacko

The School of Arts and Sciences at Ahmedabad University hosted a three-day workshop on Educational Transformations and Societal Change in Liberalizing India from January 9th to January 11th, 2020. This workshop embodied the interdisciplinary research and learning fostered by Ahmedabad University and brought together education scholars, economists, anthropologists, geographers and historians who study societal change in post-reform India. Attended by established and early career scholars as well as advanced doctoral students from universities in India and abroad, the workshop focused on the broad themes of Devolution of Governance and Democratization of Aspiration. Participants presented papers, engaged in large and small group deliberations and participated in inter-generational mentoring sessions to explore the dramatic and everyday ways in which liberalization has re-structured social institutions and subjectivities in India.

The workshop was funded by a Spencer Foundation Conference Grant awarded to Leya Mathew and Mary Ann Chacko of the School of Arts and Sciences, along with Karishma Desai, Rutgers University; R Maithreyi, formerly at the Centre for Budget and Policy Studies, Bengaluru; and Vidya Subramanian, Tata Institute of Social Sciences, Mumbai.

Leya Mathew is Assistant Professor at the School of Arts and Sciences with research interests in socio-cultural transitions accompanying economic liberalization in India. Mary Ann Chacko is Assistant Professor at the School of Arts and Sciences with research interests in critical childhood studies, citizenship education, policing in schools and gender issues in education.



AWARDED GRANTS

FOR THE PERIOD OCTOBER 2019- FEBRUARY 2020

YOUNG ACHIEVER



Niki Pandya

Mentor: Dharmesh Varade

School of Engineering and Applied Science
Awarded a prize for the 'BEST ORAL PRESENTATION' during the "National Conference on Academia-Industrial Interactions on Surfactants, Nanomaterials, Biosciences & Environmental Remediation" organised by P P Savani University, Gujarat on 9 Feb, 2020.

SIRO UPDATE

Ahmedabad University has been recognized as a Scientific and Industrial Research Organisation (SIRO) by the Department of Science and Industrial Research under the Scheme on Recognition of Scientific and Industrial Research Organisations (SIROs), 1988. The recognition has been accorded from 25.10.2019 to 31.03.2022.

External grants

Manish Datt
"Machine learning based B-Cell epitope prediction"
Ignite Life Science Foundation
0.1 lakh INR, 2 months



Shashi Prakash
"Fiber Laser based surface texturing of Aluminium-Mg alloy for adhesion improvement"
Science and Engineering Research Board
17.53 lakh INR, 2 years



Keita Omi
"Japanese language activities support grant"
Japan Foundation, Delhi
2.63 lakh INR, 7 months



Seed grants (Ahmedabad University)

Darshini Mahadevia
"Survey of heat associated morbidities in the local population"
2 lakh INR, 1 year



Supratim DasGupta
Co-PIs: Vivek Bhatt, Ahmedabad University and Ishita Tripathi, Ahmedabad University
"How can changing the academic aspirations of an educational institute benefit its students?"
0.5 lakh INR, 16 months



Snigdha Khuntia
"Microbubble enhanced absorption and conversion of NOx in water"
2 lakh INR, 1 year



RESEARCH SEMINARS

FOR THE PERIOD OCTOBER 2019- FEBRUARY 2020

Amrut Mody School of Management

1. **Swati Ghulyani**, Ahmedabad University, "Role of Personality Traits and Psychological Capital in Academic Achievement: A Longitudinal Study", Nov 27, 2019
2. **Kamal Ghosh Ray**, IFMR Graduate School of Business, Krea University, "Who Benefits from Hostile Takeover?", Nov 28, 2019
3. **Ruman Banerjee**, IIT Gandhinagar, "The Idea of Heritage: An integral, embedded and pedagogic enquiry and exploration", Dec 4, 2019
4. **Keshav Verma**, formerly IAS, Gujarat cadre, "Plans and Strategies for Riverfront Development in Ahmedabad", Dec 17, 2019
5. **Chirag Trivedi**, Ahmedabad University, "Of Who We Are - Ethnic Pride, Diasporic Regional Nationalism and Literary Elitism in K. M. Munshi's Patan Trilogy", Dec 18, 2019
6. **N Dayasindhu**, Itihaasa Research and Digital, "Evolution of Indian IT from 1950s to 2000s", Dec 19, 2019
7. **Sanjana Goswami**, University of California, Irvine, "Employment Consequences of U.S. Trade Wars", Jan 8, 2020
8. **Bhargav Adhvaryu**, CEPT University, Ahmedabad, "Developing Urban Sustainability Policy", Jan 9, 2020
9. **Ravishankar Venkata**, IIM Calcutta, Kommu "Playing the new 'game': A Bourdieusian Reading of Neoliberalization of Academic Careers in an Indian Context", Jan 13, 2020
10. **Puneet Arora**, Georgia State University, "Grading, Incentives and Student Performance", Jan 19, 2020
11. **Jayashankar Swaminathan**, University of North Carolina, "Optimizing Seed Planting Schedules For Improved Yields Under Rainfall Uncertainty", Feb 6, 2020
12. **Naren Agrawal**, Santa Clara University "Optimizing Markdowns by Leveraging Internal Flexibility in Retail Chains", Feb 19, 2020

School of Arts and Sciences

1. **Malini Bhattacharjee**, Azim Premji University, "Seva Hi Paramo Dharma': Humanitarianism and the RSS", Nov 20, 2019
2. **Sutapa Mukherji**, CSIR-Central Food Technological Research Institute, Mysore, "Physics of cellular processes: models and methods", Dec 5, 2019
3. **Samit Chakrabarty**, University of Leeds, UK, "Neurophysiological solutions towards smart affordable mobility for many", Dec 16, 2019
4. **Keita Omi**, Ahmedabad University, "Case Study on U.S. Civil Defense Policy: A Cross-Presidential Analysis of U.S. Presidential Decision Directives (PDDs)", Dec 20, 2019
5. **Tabish Umar Ansari**, National University of Ireland Galway, Ireland, "Modelling and Simulation of Regional Air Quality", Jan 9, 2020
6. **Nirvana Mitra**, Stony Brook University, New York, "Political Constraints and Sovereign Default Premia", Jan 13, 2020
7. **Arun Sukumar**, Tufts University, "Midnight's Machines: A Political History of Technology in India", Feb 6, 2020
8. **Nagireddy Neelakanteswar Reddy**, IIT Gandhinagar, "Sense of Agency: A Case Study in the Metascience (of Psychology)", Feb 17, 2020
9. **Sinjini Mukherjee**, Rutgers University, "Vitality to Venture Capital: A Historical Perspective on Umbilical Cord Blood as Therapeutic Commodity", Feb 25, 2020

School of Engineering and Applied Science

1. **Beena Singh**, Bhabha Atomic Research Centre, "Protein Based Biopolymer for Drug Delivery", Oct 4, 2019
2. **Amit Sheth**, University of South Carolina, "Knowledge Graphs and their central role in big data processing: Past, Present, and Future", Jan 2, 2020
3. **Keyur D. Joshi**, Ahmedabad University, "Transfer Learning and handling of unknown images", Jan 24, 2020

PUBLICATIONS

FOR THE PERIOD OCTOBER 2019- FEBRUARY 2020

Books and Book Chapters

Bhat, SD. (2020). Afropolitanism and the Afro-Asian Diaspora in M. G. Vassanji's *And Home Was Kariakoo*. *Afropolitan Literature as World Literature*. Ed. James Hodapp. Bloomsbury Press: New York, London. 57-70

Chaubey, AK. & Bhat, SD. (2020). *Women Writers of the South Asian Diaspora: Interpreting Gender, Texts and Contexts*. Jaipur, India: Rawat Publishers

Chapagain, NK. (2019), A Review of Policies on Preparedness, Response, and Recovery for Pre and Post-2015 Earthquakes in Nepal: Implications for The Built Heritage; in Neel Kamal Chapagain et al eds 'Reflections on the Built Environment and Associated Practices, volume 3: Revisiting the Nepal Earthquakes 2015: Resilience, Recovery, Rehabilitation and Reconstruction', Tribhuvan University, Department of Architecture and Urban Planning, Master of Science in Energy for Sustainable Social Development programme, Tribhuvan University, Nepal

Chapagain, NK., Shrestha, SK., Bhatta, KD; & Singh, S. (2019). *Reflections on the Built Environment and Associated Practices, volume 3: Revisiting the Nepal Earthquakes 2015: Resilience, Recovery, Rehabilitation and Reconstruction*; Tribhuvan University, Department of Architecture and Urban Planning, Master of Science in Energy for Sustainable Social Development programme, Tribhuvan University, Nepal

Rao-Cavale, K. (2019). *The Art of Buying Time: Legal Mobilization and Street Vendor Politics in Metropolitan India*. In Rosenberg, G., Krishnaswamy, S., and Bail, S., *A Qualified Hope: The Indian Supreme Court and Progressive Social Change*. Cambridge University Press

Suggala S., Thomas S. & Kureshi S. (2020). Impact of Workplace Bullying on Employees' Mental Health and Self-Worth. In: Dhiman S. (eds) *The Palgrave Handbook of Workplace Well-Being*. Palgrave Macmillan, Cham

Wright, S. (2020). The Books of Religion: things, persons, and consumption practices in eighteenth- and early nineteenth- century Bengal." In *Earthly Paradise: Trade, Politics and Culture in early modern Bengal*, edited by Raziuddin Aquil and Tilottama Mukherjee, 325-366

Yadav, N., Patel, V., & Singh, S. (2019). *Cerium Oxide-Based Nanozymes in Biology and Medicine*. In *advances in Spectroscopy: Molecules to materials*, (193-213), Springer, Singapore

Journal Publications

Bhagat, S., Parikh, Y., Singh, S. & Sengupta, S. (2019). A novel nanoliposomal formulation of the FDA approved drug Halofantrine causes cell death of *Leishmania donovani* promastigotes in vitro. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 582, 123852

Bhat, SD. (2019). *Ambulocetus Versus Trishanku: 'Nowhere' Space, Diaspora and Genealogical Tourism through Paleontology and Hindu Mythology*. *Journal of Tourism and Cultural Change*. London: UK, Routledge Informa Ltd (Taylor and Francis), 1-17

Chakraborty, S., Mahadevan, B., Shah, J., Panse, K., Malvi, B., Balasubramanian, C., Singh, S. & Misra, S. (2020). Enhanced detection using stable isotope enriched ⁶⁵Cu doped ferrite nanoparticles for tracing studies. *Journal of Alloys and Compounds*, 822

Chapagain, N., (2019). Book Review: *From Archaeology to Heritage Studies: Reflections from the American Experience*. *Journal of Heritage Management* 4 (1), 103-9

Devendrasinh, V., Harshad, B., Kuntal, P. & Sanjay, G. (2019). Performance of Symmetric and Asymmetric Encryption Techniques for Attribute Based Encryption, *International Journal of Recent Technology and Engineering*, vol. 8, issue 4, 176 - 182

Dhar, S., Pathak, M. & Shukla, P.R. (2020). Transformation of India's steel and cement industry in a sustainable 1.5 °C world, *Energy Policy*, 137

PUBLICATIONS

FOR THE PERIOD OCTOBER 2019- FEBRUARY 2020

Journal Publications (continued)

Jain, P., Bhagat, S., Tunki, L., Jangid, A.K., Singh, S., Pooja, D. & Kulhari, H., (2020). Serotonin-Stearic Acid Bioconjugate Coated Completely Biodegradable Mn₃O₄ Nanocuboids for Hepatocellular Carcinoma Targeting. *ACS Applied Materials & Interfaces*. 12(9), 10170-10182

Jain, V., Bhagat, S., Singh, M., Bansal, V. & Singh, S. (2019). Unveiling the effect of 11-MUA coating on biocompatibility and catalytic activity of a Gold-core Cerium oxide-shell-based nanozyme. *RSC Advances*, 9(57), 33195-33206

Jayachandran, V. N., Suresh Babu, S. N., Vaishya, A., Gogoi, M. M., Nair, V. S., Satheesh, S. K. & Krishna Moorthy, K., (2020). Altitude profiles of cloud condensation nuclei characteristics across the Indo-Gangetic Plain prior to the onset of the Indian summer monsoon. *Atmospheric Chemistry and Physics*, 20, 561-576

Jhala, D., Rather, H., Kedaria, D., Shah, J., Singh, S. & Vasita, R. (2019). Biomimetic polycaprolactone-chitosan nanofibrous substrate influenced cell cycle and ECM secretion affect cellular uptake of nanoclusters. *Bioactive materials*, 4, 79-86

Khuntia, S., Sinha, M.K. & Saini, B. (2020). Conversion of NO₂ through ozonation and peroxone process in gas and aqueous phase: Finding the suitable process through experimental route, *Chem. Eng. J.* 387, 124082

Kumar, V., Pal, N., Jangir, A.K., Manyala, D.L., Varade, D., Mandal, A. & Kuperkar, K. (2020). Dynamic interfacial properties and tuning aqueous foamability stabilized by cationic surfactants in terms of their structural hydrophobicity, free drainage and bubble extent *Colloids and Surfaces A: Physicochemical and Engineering Aspects* 588, 124362

Madhavan, V., Mukhopdhyay, I., & Ray, P. (2019). Does electronic trading influence stock prices? The Indian experience. *Applied Economics Letters*. DOI: 10.1080/13504851.2019. 1690121

Mahadevia, D., & Gough KV. (2020). Safe and Inclusive Cities: Contesting Violence, *International Development Planning Review*, 42 (1), 1-11

Naraian, S., Chacko, M.A., Feldman, C. & Schwitzman-Gerst, T. (2020). Emergent concepts of inclusion in the context of committed school leadership. *Journal of Education and Urban Society*

Rajput, G., Manyala, D.L., Pandya, N., Patel, V & Varade, D. (2020). Unusual Stability and Catalytic Activity of Gold Nanoparticles in Polyoxyethylene Cholesteryl Ether. *Journal of nanoscience and nanotechnology*, 20 (4), 2171-2178

Ramnath, A. (2020). International Networks and Aircraft Manufacture in Colonial and Postcolonial India: States, Entrepreneurs and Educational Institutions, 1940-64. *Journal of Research Institute for the History of Global Arms Transfer*, 9, 41-59

Ravipati, D., Singh, S., Harmitkumar, P. & Dalai, S. (2019). Energy Savings in Cement Industry: Use of Heat Integration Approach and Simulation Tools. *Chemical Engineering Transactions*, 76, 421-426

Saiyed, A. A. M. (2019). The role of leadership in business model innovation: a case of an entrepreneurial firm from India. *New England Journal of Entrepreneurship*, 22(2), 70-88

Singh, R., Arora, S., Kunzru, D. & Sivakumar, S. (2020). Ultrasmall Ni-promoted WS₂ nanocatalyst with enhanced number of edge atoms for hydrodesulfurization. *Energy & Fuels*, 34(1), 749-757

Singh, R., Cheng, S. & Singh, S. (2020). Oxidative stress-mediated genotoxic effect of zinc oxide nanoparticles on *Deinococcus radiodurans*. *3 Biotech*. 10(2), 66

Singhai, R., Sinhmar, H. & Banker, ND. (2020). Effect of Aspect Ratio of Heliostat on Cost of Energy from Solar Power Tower Plants, *Arabian Journal for Science and Engineering*. 45, 877-890

PUBLICATIONS

FOR THE PERIOD OCTOBER 2019- FEBRUARY 2020

Journal Publications (continued)

Thomas S. & Kureshi S. (2020). Exploring the consumer tendency to question: Consumer skepticism towards cause related marketing. *International Review on Public and Nonprofit Marketing*.

Vallabani, N.S., Singh, S. & Karakoti, A.S., (2019). Investigating the role of ATP towards amplified peroxidase activity of Iron oxide nanoparticles in different biologically relevant buffers. *Applied Surface Science*, 492, 337-348

Vallabani, N.S., Vinu, A., Singh, S. & Karakoti, A. (2020). Tuning the ATP-triggered Pro-oxidant Activity of Iron oxide-based Nanozyme towards an Efficient Antibacterial Strategy. *Journal of Colloid and Interface Science*, 567, 154-164

Conference Proceedings

Agarwal S., Gupta D., Dandotiya D. & Banker N., (2019). Energy and exergy analysis of a gas turbine power plant integrated with vapor adsorption refrigeration, *Proceedings of the ASME 2019 Gas Turbine India Conference. Volume 1: Compressors, Fans, and Pumps; Turbines; Heat Transfer; Structures and Dynamics*. Chennai, Tamil Nadu, India. December 5-6, 2019, 83525, V001T03A012

Desai B, Mukherjee S & Ghosal R. (2019). Using dorsal scute patterns to identify wild muggers within human-dominated landscape of Central Gujarat, 34th Gujarat Science Congress

Desai C, Panchal N & Ghosal R. (2019). Effects of habitat enrichment on stress physiology of Leopard (*Panthera pardus*) under captive conditions, 7th International Society of Wildlife Endocrinology, South Africa

Dahiya A., Bhattacharya J. & Banker N. (2019). Thermodynamic Analysis and Performance Enhancement of Air and CO₂ based Compressed Gas Storage Systems, *Proceedings of the ASME 2019 Gas Turbine India Conference. Volume 2: Renewable Energy: Solar and Wind*. Chennai, Tamil Nadu, India. December 5-6, 2019. V002T06A010. ASME

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INSTITUTIONAL BIOSAFETY COMMITTEE (IBSC)

The constitution of an Institutional Biosafety Committee (IBSC) at Ahmedabad University has been approved on Jan 31, 2020.

The Institutional Biosafety Committee (IBSC) is an internal regulatory committee created under the guidelines of Department of Biotechnology, Government of India. The IBSC will review all research activities involving biohazardous substances, and has overall responsibility for maintaining the biosafety guidelines within the University. Biohazardous substances include, but are not limited to, recombinant DNA, RNAi, genetically modified organisms (GMOs), pathogens, human materials and other potentially infectious material. Following the guidelines of IBSC, it is the duty of Principal Investigators (PI) to apprise the IBSC about experiments involving biohazardous substances and seek approval from IBSC prior to conducting similar experiments within the University premises.

The process for seeking approvals from the IBSC will be communicated in due course.

FULBRIGHT FELLOWSHIPS

A talk by Dr. Ryan Pereira, Regional Officer, United States-India Educational Foundation was arranged by the Graduate School. Dr. Pereira visited Ahmedabad University on 5 February 2020 and spoke about Fulbright Fellowship Opportunities to the U.S for the doctoral students, researchers and faculty members at Ahmedabad University. There was a discussion on the various fields of study and research that are supported by the Fulbright Fellowships. Dr. Pereira also shared some tips on how to submit a competitive application. Fulbright-Nehru Awards enable the most outstanding students, academics and professionals in India and the U.S. to study, research and teach in the host country.

Details of all Fulbright Fellowship schemes for 2020-2021 can be accessed at <http://www.usief.org.in>





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All requests for research funding from internal and external sources should be sent to the University Research Board for approval, via the Grants Portal.

Details of intramural funding available via Ahmedabad University are available in the University Research Board Policy Document. This includes Start-up grants, Seed grants, University Challenge grants, Teaching Material Development/Innovation grants and Conference Travel support.

Previous editions of the Research Horizons Newsletter and Funding compendium are archived on AURIS.

For suggestions on the Funding compendium, please contact the Dean of Graduate School and Research at urb@ahduni.edu.in.