VIVEK AGARWAL

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Areas of Strength and Expertise

Geoinformatics • Geographic information system (GIS) • ArcGIS • QGIS • Data Analysis and Visualisation • Statistics • Microwave and Optical Remote Sensing • InSAR • ENVI-SARscape • GRACE gravity satellite • Environment Sciences • Climate Change • Civil Engineering • Hydrology • R programming • Matlab Programming • Python Programming • Physics • Mathematics • Strategic Planning • Team player • Time management • Relationship building • Leadership skills • Performance Management • Technology Integration • MS Office • Adobe Photoshop • Online Teaching (Zoom and MS-Teams).

Education

10/2017 – Present — Final-year Doctoral Researcher in Engineering Surveying and Space Geodesy, University of Nottingham (UoN) (Submitted: October 2021)

Research Topic: Groundwater properties and behaviour in London using geospatial techniques (GIS and Remote Sensing).

Summary: Monitoring of groundwater quantity and quality is essential for the survival of humankind. Significant changes in groundwater quantity can cause land deformation. This deformation has been studied using radar interferometry, and groundwater motion has been studied using GRACE gravimetry. Also, groundwater quality has been studied using observed data for the last 20 years, and a model has been suggested to link groundwater quantity and quality variation.

Supervisors: Prof Stuart Marsh and Prof Rachel L. Gomes

07/2014 – 07/2016 — M.Tech in Civil Engineering (Geomatics), Indian Institute of Technology (IIT), Roorkee and Leibniz University, Hannover, Germany (Obtained 91.29 per cent)

Research Topic: Analysis of GRACE satellite gravity data for north India with emphasis on hydrology.

Summary: In Northern India, water depletion has been reported because of advancements in urbanisation. The total water change for north India for 13 years (2003-2016) was studied in terms of Equivalent Water Height (EWH), obtained from GRACE satellite data. Different gravity functional maps were obtained and filtered. Temporal, spatial, and frequency EWH graphs are studied for different north Indian cities. 3D and 2D Monsoon seasonal maps were made using ArcGIS, and EWH values were compared with rainfall data. Total water loss in north India between 2003 and 2016 was quantified.

Supervisors: Prof. S.K.Ghosh, Prof. O.P.Dubey and Prof. Jakob Flury

05/2009 – 05/2013 — B.Tech in Civil Engineering, ITGGV, Central University, Bilaspur, India (Obtained 88.2 per cent)

Academic Work Experience

10/2021 - Present — Graduate Student Research Assistant for Rights Lab, Beacon of Excellence, University of Nottingham.

My main job is to use historical and longitudinal GIS data to quantify the effects of increasing temperatures on “unfree” labour productivity and how this productivity influences the prevalence of modern slavery. I contribute to searching, identifying, and analysing global circulation models (GCMs) relevant for India; and supporting the applications of wet-bulb globe temperature (WBGT) models.

09/2018 - Present — Worked as Demonstrator (Researcher Academy and Engineering labs at UoN)

My main job is to conduct lab sessions, equipment training, and support delivery of Training and Learning courses to undergraduate and postgraduate students. I have demonstrated for various labs, including Surveying lab, GIS lab, Matlab Programming, R programming, Latex lab, Project Planning Management.

07/2019 – Present — Teaching in the classroom and on online platforms (Google classroom, Zoom, Microsoft teams, Seneca, etc.) with proper technology integration.

Teaching Engineering, Maths and Physics offers one-to-one tutorial support to students who need special support.

11/2016 – 07/2017 — Assistant Professor, Civil Engineering, University of Petroleum and Energy Services (UPES), Dehradun, India.

Teaching civil engineering to undergraduate and postgraduate students, setup assignments and marking them to ensure the understanding of the students, offer one to one tutorial support to the students who need special support, setup the lab and other teaching materials and conducting the lab in accordance to the lectures to get real-life examples, to evaluate the students’ performance at the end of each semester

08/2016 – 10/2016 — Junior Research Fellow at Environment Engineering Department, IIT Roorkee.

Carrying out research work in Environment Engineering, water depletion and water pollution using GIS principles.

Non-Academic Work Experience

09/2021 - Present	Disability support worker for teaching Math's and notes taking. Work with students having disability (for ex: Dyslexia, Autism). Provide care and help to students in the university with mental health conditions or physical disabilities in taking class-notes and learning Maths.
09/2018 – 09/2021	Head of Resident Tutors team, Raleigh Park, University of Nottingham To ensure pastoral care and discipline of around 1200 students at university resident hall by signposting the information and facilities related to student welfare on a 24/7 basis.
09/2018 – 09/2021	Postgraduate Research Engineering Community (PGREC) Representative for Engineering Research/Nottingham Geospatial Institute. My main job was to give feedback to key Faculty of Engineering staff members, including the Director/Deputy Director of Postgraduate Research and the Research Operations Manager (PGR) issues and comments from my Research Group.
09/2018 – Present	International student ambassador of UoN.
10/2017 – 10/2018	Environment and Social Justice officer for Raleigh Park, University of Nottingham. Elected position in Student Union of the University of Nottingham. My job was to ensure safe and social Environment to university students via organising various events and environmental drives.
11/2016 – 07/2017	Worked as Training and Placement head at UPES, Dehradun, India.

Grants and Scholarships Received

01/2019 – 06/2020	Principal Investigator (PI) for European Space Agency (ESA) Earth Observation data hosted processing for science (EOhopS) project on 'Studying groundwater properties and behaviour using geospatial techniques' between 01/2019 - 06/2020 for remote-sensing data and ENVI-SARscape software license and workbench.
10/2017 – 12/2020	Recipient of the Faculty of Engineering Research Excellence PhD scholarship, UoN.
10/2021 and 10/2019	Awarded Researcher Academy Conference Travel Fund 2021 and Graduate School Travel Prize - 2019 from the University of Nottingham.
12/2019 and 12/2018	Awarded GRSG Student Travel Bursary -2019 and 2018 to attend AGM conference in Rome and London, respectively.
09/2015-03/2016	Recipient of the DAAD-IIT Master Sandwich Scholarship for conducting M.Tech dissertation work at Leibniz University, Hannover, Germany.
10/2015	Grant received for training at Global gravity field modelling from satellite-to-satellite tracking data, WE-Heraeus autumn school, Bad Honnef, Germany.
07/2014-07/2016	Ministry of Human Resource and Development (MHRD), Government of India, fellowship for pursuing M.Tech from IIT Roorkee.
06/2012 to 07/2012	Grant received for B.Tech major project Internship at The Indian Institute of Science (IISC), Bangalore, sponsored by University Grants Commission (UGC), Government of India.

Research and Scientific Societies

Student delegate member of American Geophysical Union (AGU), Florida, USA; European Geosciences Union (EGU), Vienna; Royal Institute of Navigation (RIN), Cambridge university, London; and The Geological Remote Sensing Group (GRSG), London, UK.

Journal Publications

Agarwal, Vivek*; Kumar, Amit; David Gee, Stephen Grebby, L. Gomes, Rachel; Marsh, Stuart. 2021. 'Comparative study of groundwater-induced subsidence for London and Delhi using PSInSAR'. Remote Sensing (*Minor revision: Manuscript ID: remotesensing-1422188).*

Zhengyuan Qin*****, **Vivek Agarwal**, David Gee, Stuart Marsh, Stephen Grebby, Ningkang Meng. 2021. 'Study of ground movement in mining area with geological fault using FDM analysis and Stacking InSAR method'. Frontiers in Environmental Science. *(In revision: manuscript number: 787053).*

Kumar, Amit; **Agarwal, Vivek***; Pal, Lalit; K. Chandniha, Surendra; Mishra, Vishal. 2021. 'Effect of land surface temperature on Urban Heat Island in Varanasi city, India'. J, Environmental Sciences, no. 3: 420-429. https://doi.org/10.3390/j4030032.

Agarwal, Vivek*; Kumar, Amit; L. Gomes, Rachel; Marsh, Stuart. 2020. 'Monitoring of Ground Movement and Groundwater Changes in London Using InSAR and GRACE' Applied Sciences 10, no. 23: 8599. https://doi.org/10.3390/app10238599

Panwar, Sugandha*; **Agarwal, Vivek** and Chakrapani, Govind. 2017. 'Morphometric and sediment source characterisation of the Alaknanda river basin, headwaters of river Ganga, India.' Natural Hazards, 87, 1649–1671. https://doi.org/10.1007/s11069-017-2838-y.

Conference Publications and Presentations

Agarwal, Vivek; Kumar, Amit; L. Gomes, Rachel; Marsh, Stuart. 2021. Investigating spatio-temporal changes in groundwater quality for London between 2000-2020. AGU Fall Meeting, New Orleans, Louisiana, 13-17 December 2021 *(Accepted for presentation).*

Mishra, Vishal; Malik, Kapil; Jain, Kamal; **Agarwal, Vivek**; Tiwari, Anuj. 2021. 'Remote-sensing based assessment of sustainability of anthropogenic interventions on mountain slopes for green field airport development: a case study of the Pakyong Airport, India'. AGU Fall Meeting, New Orleans, Louisiana, 13-17 December 2021 *(Accepted for presentation)*.

Agarwal, Vivek; Kumar, Amit; L. Gomes, Rachel; Marsh, Stuart. 2021. 'Comparison of groundwater induced Land subsidence in London and Delhi using PSInSAR'. The European Geosciences Union, EGU General Assembly 2021, online, 19–30 Apr 2021, hosted at Vienna, Austria, EGU21-10707, https://doi.org/10.5194/egusphere-egu21-10707, 2021.

Agarwal, Vivek; Kumar, Amit; L. Gomes, Rachel; Marsh, Stuart. 2020. 'An Overview of Sar Sensors And Software And A Comparative Study Of Open Source (Snap) And Commercial (Sarscape) Software For DInSAR Analysis Using C-Band Radar Images'. *Asian Conference of Remote Sensing – 2020, November 9-11 online, hosted at Deqing city, China.*

Agarwal, Vivek; L. Gomes, Rachel; Marsh, Stuart. 2019. 'Studying groundwater variation using geospatial techniques'. The Geological Remote Sensing Group (GRSG) AGM -2019, December 9-12 at European Space Agency in Frascati, Italy.

Agarwal, Vivek; L. Gomes, Rachel; Marsh, Stuart. 2018. 'Open source DInSAR processing for Sentinal-1 data using ESA SNAP'. The Geological Remote Sensing Group (GRSG) AGM -2018, December 9-12 at Geological society, Piccadilly, London.

Agarwal, Vivek; Chowdhury, Raja; Mamtani, Kapil; Suyal, Deepak. 2017. 'Variability in Greenhouse Gas Emission in Algal Biofuel Production Resulted from Nutrient Recycling'. The 4th International Conference On Energy and Environment Research – 2017, July 17-20 at ISEP (Polytechnic of Porto), Portugal.

Agarwal, Vivek; Panwar, Sugandha; Ghosh, Sanjay; Dubey, Om. 2017. 'Study of change in water content of Uttarakhand using GRACE satellite gravity field data'. *International conference on Urban Geoinformatics-2017*, February 22-23 at TERI University, New Delhi, India.

Other Highlights

Reviewer of Journals like Natural Hazards, Data for Policy 2021, MDPI Remote Sensing, Applied sciences, and Sustainability.

Young Researcher Award by Bangalore Scholar Institute, an ISO 9001:2015 certified institute by International accurate certification, accredited by UASL, awarded on 3rd May 2021.

Acquired 2nd position in M.Tech. course at IIT Roorkee.

Got 99.8 percentile in The Graduate Aptitude Test in Engineering (GATE) 2015 examination.

Qualified Indian Railways Recruitment Board (RRB) examination (2014).

Certificate of merit for being in top 0.1 percent of successful candidates of All India Secondary School Examination 2007 (CBSE Class 10th) for getting 99% marks in Science and Technology.

Languages Known English (Fluent), Hindi (Fluent), Deutsch (A1, Beginner), Bengali (Beginner)