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DAAD – A new passage to India

Verkehr-SuTra: Technologies for Sustainable Transportation

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1. Verkehr-SuTra Overview

- "Verkehr" or traffic in German is combined with the Sanskrit term "SuTra" denoting both the concept of Sustainable Transport and the principles that should be developed and imparted to young researchers to facilitate sustainable transportation in the future.

- The project's aim was to enable collaboration between German and Indian scientists from TUM and IIT Kharagpur by training Master's, Doctoral, and Postdoctoral candidates in sustainable transportation solutions that integrate India's unique transport needs and constraints with German engineering technologies.

2. Research collaborations

- Although the project faced enormous challenges due to the Covid-19 pandemic, where travel restrictions for more than 2 years hindered in-person meetings, the project was able to establish valuable networking connections through regular remote online meetings. The following table summarises the connections established pre-Covid-19:

Researcher	Visit Details
Prof. Pallab Dasgupta (IIT Kharagpur)	To TUM, May 2019
Prof. Samarjit Chakraborty (TUM)	To IIT Kharagpur, Jun 2019
Mr. Jyotirmaya Sahoo (PhD, IIT Kharagpur)	To TUM, Jun/Jul 2019
Dr. Sumana Ghosh (Postdoc, IIT Kharagpur)	To TUM, Sep 2019 – Feb 2020
Prof. Dipankar Debnath (IIT Kharagpur)	To TUM, Sep 2019

- Collaborations with Dr. Sumana Ghosh led to 2 journal papers on embedded control systems and wireless network control. There are also a number of ongoing working papers through collaborations with visiting researchers Gagan Gupta, Manish Kumar Yadav, and Aayush Kumar Verma.
- The Chair of Transportation Systems Engineering led by Prof. Constantinos Antoniou further published 11 papers in high-impact academic journals targeting topics to enhance transportation in India, with some including Indian data as the basis of their analysis. Topics covered included: attitudes to car and scooter sharing, multi-modal warning-monitoring systems, big data for shared mobility operations, and pedestrian-vehicle safety.
- An important point to be resolved in future projects – Indian citizens from TUM were unable to travel to IIT Kharagpur as per the project's contract, which impeded collaboration.

3. Further Indo-German projects

- TUM and IIT Kharagpur previously partnered on the Futuretrans project, which resulted in the development of a joint research center located at IIT Kharagpur and the launch of a new Master's degree in Transport.
- An international workshop brought together researchers from TUM, IIT Kharagpur, TU Berlin, TU Chemnitz, and TH Ingolstadt as well as industry representatives from Siemens, Bosch, Infineon, ETAS, Tata Motors, Tata Consultancy Services, OLA Cabs, and Teratrace, and key policy makers from India, who promised their support for the joint research center.
- The launch of the center and workshop were widely covered in the Indian press and media, including the Indian Express[1], NDTV[2], and Jagranjosh[3], among others[4].

Picture: Launch of a dedicated Transport Master at IIT KGP

- The Verkehr-SuTra project also led to 2 new projects:
  - The "Indo-German Partnership Project" (IGP), funded by the DAAD and the Indian University Grants Commission, was established to promote collaboration between Professors at TUM, IIT Kharagpur, and IIT Bombay.
  - The "Warrants for automation of toll plazas under mixed traffic conditions" project, funded by the DAAD in collaboration with the SV National Institute of Technology, Surat, India, aimed to alleviate congestion and delay at toll plazas on Indian roads.

4. Future directions

Both TUM and IIT Kharagpur are keen to extend their partnership. We are currently collaborating on a project to analyse Mobility as a Service (MaaS) acceptance in developing countries, and launched a new travel behaviour survey together in February 2024.

References:

1. indianexpress.com/article/education/iit-kharagpur-munich-university-join-hands-for-centre-on-intelligent-transportation-systems-5233484/
2. https://www.ndtv.com/education/iit-kgp-hosts-indo-german-workshop-on-intelligent-mobility-
3. https://www.jagranjosh.com/news/iit-kharagpur-hosts-indo-german-workshop-on-intelligent-
4. https://www.mos.ed.tum.de/en/vvs/forschung/projekte/futurtrans/