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International Summer School on UAV photogrammetry, laser scanning and bathymetry 2024 in Szczecin

An article by THOMAS P. KERSTEN

The International Summer School 2024 in Szczecin took place from 16 to 18 September at the Maritime University in Szczecin and was aimed at Master's and doctoral students. Around 60 participants from Europe deepened their knowledge of UAV photogrammetry, laser scanning, bathymetry and point cloud processing through specialist lectures, practical workshops and group projects. The event was organised by the DGPF and PTFiT. In addition to professional dialogue, the focus was also on excursions and networking. A continuation is planned for 2026 in Darmstadt.

> Die International Summer School 2024 in Szczecin fand vom 16. bis 18. September an der Maritimen Universität in Stettin statt und richtete sich an Masterstudierende und Doktoranden. Rund 60 Teilnehmende aus Europa vertieften ihr Wissen in UAV-Photogrammetrie, Laserscanning, Bathymetrie und Punktwolkenverarbeitung durch Fachvorträge, praktische Workshops und Gruppenprojekte. Organisiert wurde die Veranstaltung von der DGPF und der PTFiT. Neben dem fachlichen Austausch standen auch Exkursionen und Networking im Fokus. Eine Fortsetzung ist für 2026 in Darmstadt geplant.

Author

Thomas P. Kersten is Professor for Photogrammetry and Laser Scanning at the HafenCity University Hamburg (HCU).

thomas.kersten@hcu-hamburg.de

The International Summer School on UAV photogrammetry, laser scanning and bathymetry 2024 was held from 16th to 18th September 2024 at the Maritime University of Szczecin (Poland). This event was hosted by the Department of Geodesy and Offshore Survey at the Maritime University of Szczecin and was organised by the German Society for Photogrammetry, Remote Sensing, and Geoinformation (DGPF) in cooperation with the Polish Society for Photogrammetry and Remote Sensing (PTFiT). The Summer School was prepared by an organising committee of Polish and German colleagues from both societies under the leadership of Dr. Tomasz Kogut (Maritime University of Szczecin), Prof. Dr.-Ing. Dorota Iwaszczuk (Techni-

cal University of Darmstadt) and Prof. Dr. Krzysztof Bakuła (Warsaw University of Technology).

This Summer School was specifically designed for PhD and Master's students seeking to enhance their knowledge and skills in UAV photogrammetry, laser scanning, bathymetry and point cloud processing. The event brought together experts, students and doctoral candidates from Poland, Germany and other European countries to discuss the latest technologies in these fields. Nearly 60 participants took part in lectures, practical workshops and group projects, gaining both theoretical knowledge and practical experience (Fig. 1). Five students of the Master's programme Geodesy and Geoinformatics with specialisation in Hydrography



Fig. 1: Participants and lecturers of the International Summer School at the Maritime University of Szczecin





Fig. 3: The training and research vessel Nawigator XXI (left) and the survey vessel Akustyka

of the HafenCity University (HCU) Hamburg attended the Summer School (Fig. 2).

The Summer School was organised in four topics, which were presented as lectures and workshops by Polish and German lecturers:

- UAV Photogrammetry (Prof. Dr.-Ing. Wolfgang Kresse, Neubrandenburg University of Applied Sciences, Prof. Dr. Grzegorz Stępień, Maritime University of Szczecin);
- Laser Scanning (Dr. Małgorzata Jarząbek-Rychard and Prof. Dr. Grzegorz Jóźków, both from Wrocław University of Environmental and Life Sciences, Prof. Dr.-Ing. Uwe Sörgel, University of Stuttgart);
- Bathymetry (Prof. Dr.-Ing. Thomas P. Kersten, HafenCity University Hamburg, Prof. Dr. Arkadiusz Tomczak, Maritime University of Szczecin, M.Sc. Mechanical Engineering Anders Ekelund, Hexagon Geosystems);
- Optimise Point Cloud Processing with Neural Networks in Python (Prof. Dr.-Ing. Ludwig Hoegner, München University of Applied Sciences).

After being welcomed by the Vice-Rector for Maritime Affairs of the Maritime University of Szczecin, by Prof. Dr. Arkadiusz Tomczak, the Vice-President of the DGPF, Prof. Dr.-Ing. Dorota Iwaszczuk (Technical University of Darmstadt) and the President of the PTFiT, Prof. Dr. Krzysztof Bakuła (Warsaw University of Technology), the above-mentioned topics were presented as comprehensive lectures by the speakers on Monday. After the lectures, the participants visited the training and research vessel Nawigator XXI (Fig. 3) on the River Oder in the late afternoon, where they were divided into different groups for a detailed tour of the ship. In the evening, the first impressions of the Summer School were discussed and the participants got to know each other better at the Ice Breaker Party.

On the second day, workshops on the four topics were held by experts from renowned German and Polish universities. The participants of the Summer School were divided into the four subject areas. In the UAV photogrammetry workshop, data from a drone flight over the university campus was analysed using two different software packages. In the laser scanning workshop, objects on the university campus were scanned with a terrestrial laser scanner and then analysed in the seminar rooms. The group that chose bathymetry was able to use the simulation software DVocean Digital from HCU Hamburg to try out different measurement scenarios with a multibeam echo sounder in the virtual port of Hamburg (Fig. 4). Before that, Anders Ekelund (Vice President Airborne Bathymetric LiDAR at Hexagon Geosystems) gave a comprehensive presentation on airborne bathymetric LiDAR. The point cloud processing workshop taught participants how to process large point clouds using neural networks in the Python programming language. On Tuesday morning, participants of the bathymetry group were able to take part in a demo cruise on the survey vessel Akustyka (Fig. 3) of the Maritime University of Szczecin. After lunch, the participants of the Summer School introduced themselves in a short statement and briefly described their scientific interests. In the evening, a social dinner was held at the Vulcan Hotel.

On the third day, the groups of participants presented the results of their work, before all participants received their certificates in a ceremony. The International Summer School in Szczecin provided an excellent opportunity for young scientists to deepen their knowledge of modern geodetic methods and to exchange ideas with experts from Germany and Poland. The combination of theory, practice and networking made the event a valuable experience for all participants. Special thanks go to all speakers, organisers and participants who contributed to the success of this Summer School. The continuation of the initiative is in preparation and further cooperation with PTFiT is planned. The next joint Summer School will take place in Darmstadt in 2026. //



Fig. 4: Presentation of the DVocean Digital simulation software of HCU Hamburg