

Masterarbeit/Master Thesis

„Automation and management of an innovative measurement system for the detection of high-frequency, sub-nanometric mechanical vibrations“

About us

CTR Carinthian Tech Research AG is an industry-oriented research and development center for smart sensors and system integration. As the largest non-university research center in southern Austria, CTR has gained a reputation for expertise in R&D sensor technologies serving science and industry at both a national and international level. CTR focuses on four main research areas: Microsystem Technologies, Packaging & Hetero-integration, Photonic Sensor Systems and Smart Systems. In the Austrian COMET program, CTR features with "ASSIC Austrian Smart Systems Integration Research Center" as a K1 center of excellence.

Short description

The detection of small amplitude high-frequency mechanical vibrations is of great interest, in many scientific and technical domains. A notable application is the characterization of propagating waves and resonant modes in micro-acoustic resonators (Surface Acoustic Wave devices), for sensing and telecommunication applications. The goal of the Master Thesis is to pursue the development of a characterization instrument, based on the Heterodyne Interferometry principle. First, a high-precision movable and controllable sample holder will have to be selected, mounted and programmed. Then, set-up management software(s) will be developed, to enable the automated scanning of a given surface in spatial and frequency domains, over long acquisition times and with adjustable settings. This requires real time control of the different modules, including the optics (Laser), the translation stage, the power supply, the photo-detectors and the complete data acquisition chain. An HMI will also have to be designed, and programmed. The HMI will include a data processing module, to visualize and process the scanning results.

Tasks

The Master Student will implement and test the different parts (translation stage etc.) and control programs that are required to fully automate the existing measurement set-up. This includes the programming of a suitable HMI. The Master Student will work in strong collaboration with CTR Experts in various fields (electronics, mechanics, acoustics and optics). The student will perform experimental tests, to validate the proper working of the implemented parts and programs. Ideally, at least one innovative high-frequency SAW device will be automatically characterized, before the end of the internship. If possible, the results of the work will be published in an international peer-reviewed scientific journal.

Start Date / Duration / Contract

Start date (planned): the position is immediately available

Contract: We offer you a salaried position including all related rights and duties for employer and employee. The position will be time-limited according to the duration of the master thesis

Duration (planned): 6 months

Place: Villach, Austria

Profile / requirements

- Master Student in Mechatronics, Instrumentation and Measurement, or similar.
- Programming skills (LabView)
- Ability to tackle and solve practical problems; Teamwork skills

Application: www.ctr.at/en/application or www.ctr.at/bewerbung

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