

AUFGABE DER MASTERARBEIT

im Studiengang “International Studies in Engineering“

für : **Yiyang Liu**
gestellt von: **Prof. Dr.-Ing. Ingolf Willms**
Thema : Wavenumber Based Imaging Algorithm for Wideband Bi-Static Radars

Compared to other technologies such as optical or infrared systems wideband radars do not need a visual LOS making it suitable for smoke and dust filled indoor emergency scenarios. Thus, robots with mounted Radar systems are attractive for detection and imaging in emergency situations. In the frames of this master thesis two imaging algorithms for wideband radars in bi-static configuration will be provided. Wavenumber radar migration algorithms have been proven to provide a rather accurate and fast image of the area under test. However, a major drawback of these imaging methods is their lower resolution capabilities compared to the more time consuming Kirchhoff migration algorithms. Furthermore, originally the wavenumber method was only defined for monostatic antenna configuration. This master thesis will improve on the classical wavenumber imaging method by extending the algorithm for bi-static scenarios for wideband radars. The results of the new method will be compared using the imaging methods developed at the department of NTS. Thus, the task of this master thesis can be separated into the following:

- To create a detailed time and work plan.
- Literature research on wavenumber imaging algorithms for radars.
- Design of a measurement test scenario for bi-static wideband imaging radars.
- Implementation of a new wavenumber imaging method for the given measurement scenario and comparison analysis using the imaging methods developed at the department of NTS.
- Documentation of the master thesis and a presentation of the results.

Zweitgutachter: Prof. Dr.-Ing. Andreas Czulwik

Duisburg, den _____

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ERKLÄRUNG

Hiermit erkläre ich, dass ich die Arbeit bis auf die offizielle Betreuung durch den Aufgabensteller selbständig und ohne fremde Hilfe verfasst habe.

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