

**Title:** Deployment Strategies for in-situ Sensors in Agriculture

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**Abstract:**

Deploying an in-situ sensor network for monitoring crop parameters increases the temporal resolution of measurements. These measurements can be used for calibration of remote sensors and/or agricultural growth models. On heterogeneous sites, the positions of the single sensors have a crucial impact. Leveraging existing knowledge can be used to develop sophisticated and application driven deployment strategies for the different nodes of the sensor network.

The goal of this thesis is to develop optimal deployment strategies for the selection of representative sensor node positions in agricultural fields based on a-priori knowledge given by soil maps and/or remote sensing data. Moreover, mechanisms could be developed for a meaningful fusion of temporally high-resolution data from sensor networks and spatially high-resolution data from sensor mapping.

**Desired skills of the applicant:**

- sophisticated programming skills
- experience and/or interest in embedded sensor networks
- willingness to conduct real-world experimental deployments

**References:**

Bauer et al.: "On the Potential of Wireless Sensor Networks for the In-Situ Assessment of Crop Leaf Area Index" Elsevier Computers and Electronics in Agriculture, Vol. 128, Oct. 2016, pp. 149-159.  
<https://doi.org/10.1016/j.compag.2016.08.019>

Hänel et al.: "Using Distributed Compressed Sensing to derive Continuous Hyperspectral Imaging from a Wireless Sensor Network", Elsevier Computers and Electronics in Agriculture, Vol. 166, Article 104974, Nov. 2019  
<https://doi.org/10.1016/j.compag.2019.104974>