

# The Prototype of a Vehicle which Takes Preventive Measurement of Soil Conditions Autonomously

Lazarek, Piotr (School: Zespol Szkol Ogolnoksztalcacych Filomata)

Over a year ago now I asked myself a question: did an affordable, efficient solution for measuring soil condition exist in the marketplace? Acting on my curiosity I performed some research, and to my frank surprise it transpired that such a technology had not yet been developed. Sensing an opportunity, I decided to design and create such a device myself. My vehicle uses a replaceable ion-selective electrode system in order to measure the concentration of specific ions in soil. The prototype also uses a humidity sensor in order to generate an irrigation map of the farmland in question. Thanks to its GPS system, a magnetometer and a series of simple trigonometric functions, my device is fully automated, complementing which I also created an intuitive mobile application which affords users the opportunity to define the path of the vehicle themselves. Up until now the taking of preventive measurements of soil condition has been considered a time consuming and expensive task, which has lead to most farmers opting against collecting data. My prototype significantly decreases such time and financial restrictions, and because of its simplicity of use and the autonomous nature of its operation, it can be used by anyone. I believe my innovation could become a widely used tool, which could pave the way for the preventive measurement of soil condition becoming much more commonplace.

## **Awards Won:**

First Award of \$3,000

International Council on Systems Engineering - INCOSE: First Award of \$1,500