

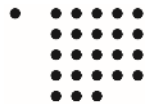


Analysis of Anaerobic Digestion by MIR, NIR, UV/VIS online spectroscopy

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Funded by
the European Union

About Me

- Graduated Liverpool University 2010 MENG EEE.
- Worked at EA Technology for 3.5 years.
 - Project management.
 - Research.
 - Hardware design.
 - Programming.



Training Experiences Within ATBEST

- ATBEST Summer School 30th June – 4th July 2014 in Essen.
- IBBK UK Biogas Intensive Engineering Course 14th July – 16th July 2014 in Cambridgeshire.
- Progress in Biogas 3 conference 10th-11th September 2014 in Stuttgart.
- Biogas Science 2014 conference, 26th-30th October 2014 in Vienna.
- STEPS Meeting on 2nd October 2014 in Gummersbach.
- 2nd Conference on Monitoring & process control of anaerobic digestion plants, Leipzig – March 17th – 18th .
- Ongoing self-study into Biogas production.
- Ongoing self-study into Machine learning.

Project Main Objectives

- MEMS Spectroscopy for measurement of Anaerobic Digestion.
- MIR spectroscopy.
- Machine Learning to estimate concentrations from spectra.
- Optimised control of anaerobic digestion plant based on measured concentrations.

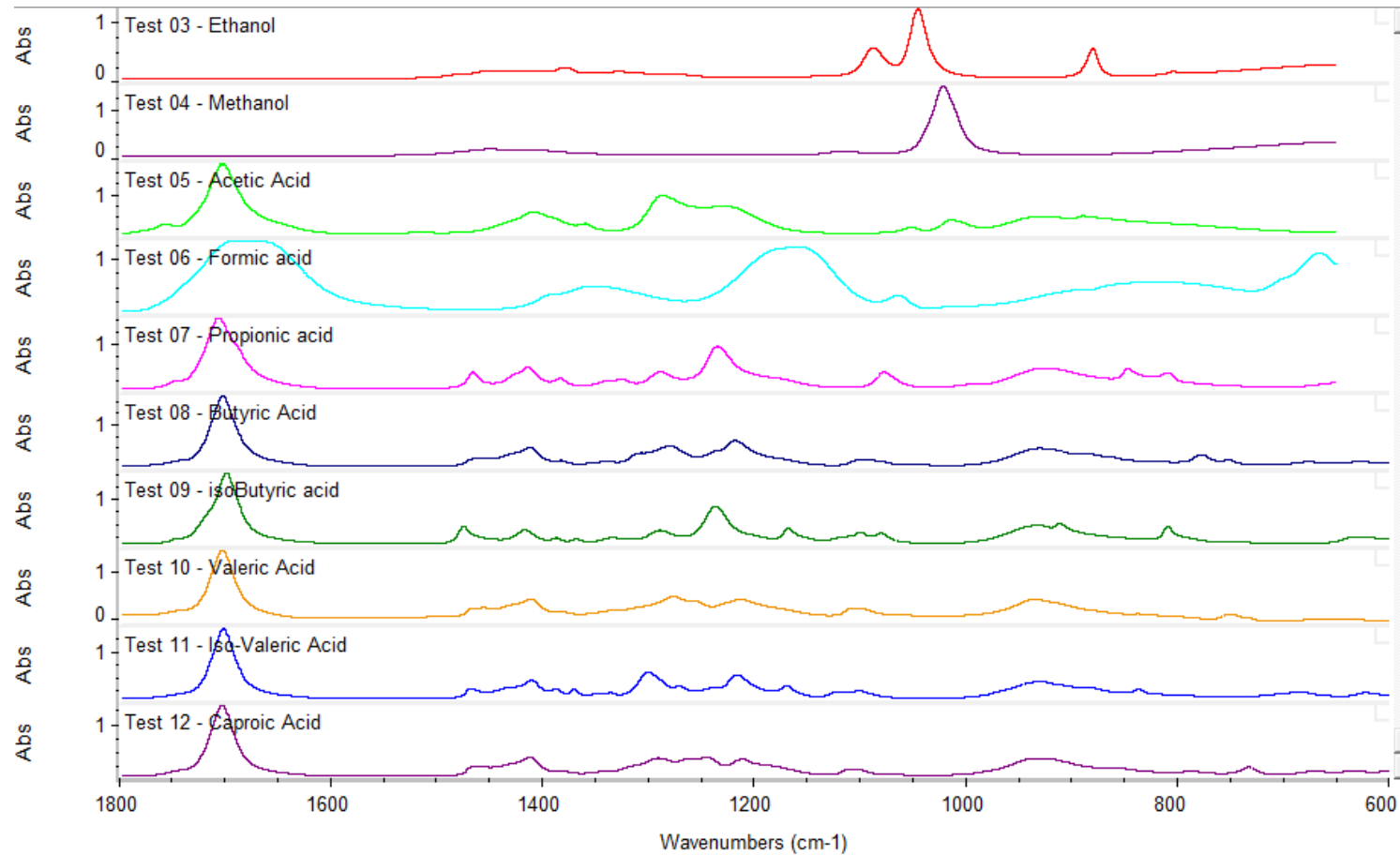
Methodology

- Measure synthesised samples for sensitivity & training data.
- Measure real samples.
- Machine learning.
- Integrate measurements into control loop.
- Evaluate performance on pilot scale plant.

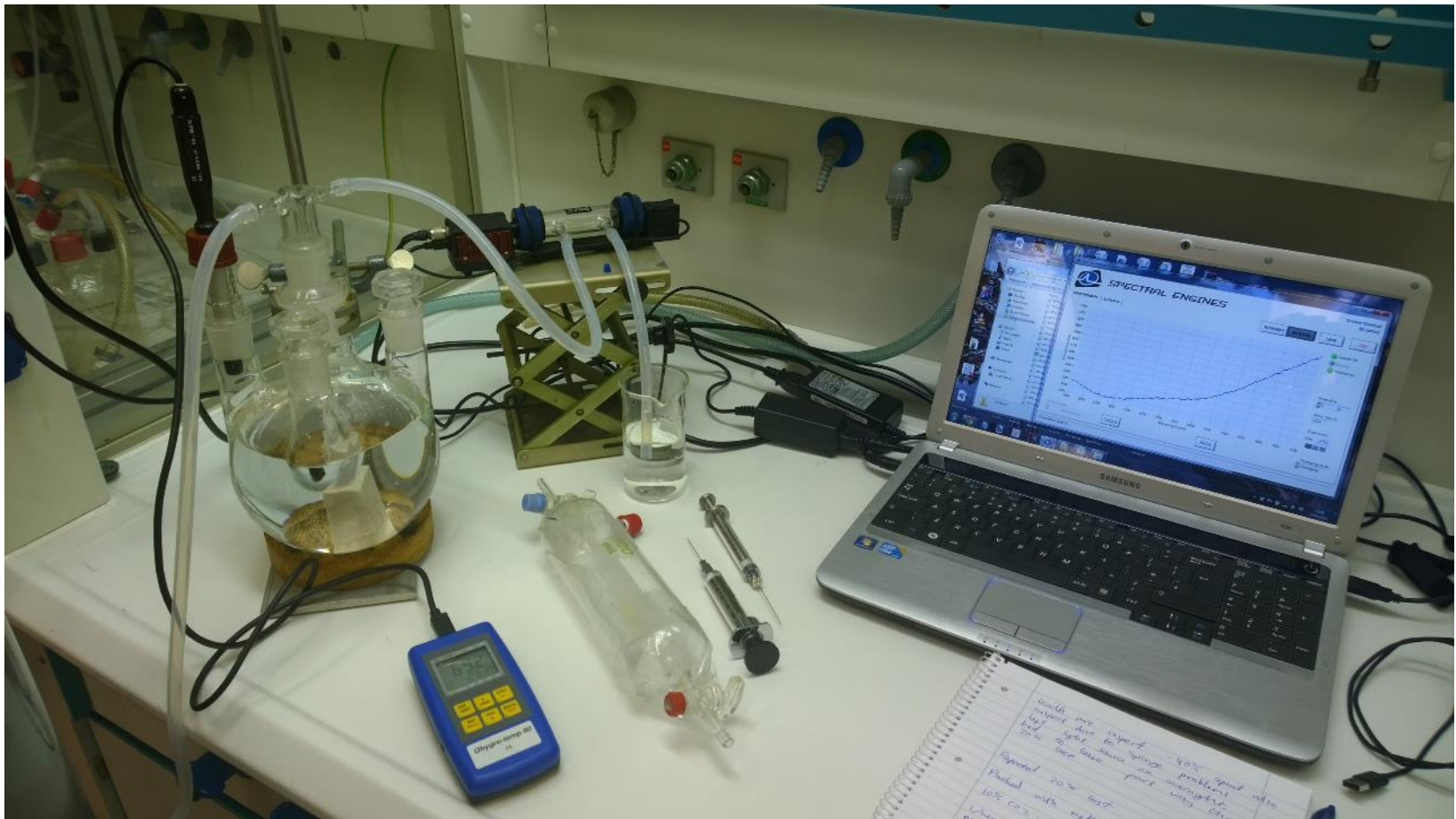
Lab Liquid Phase Tests



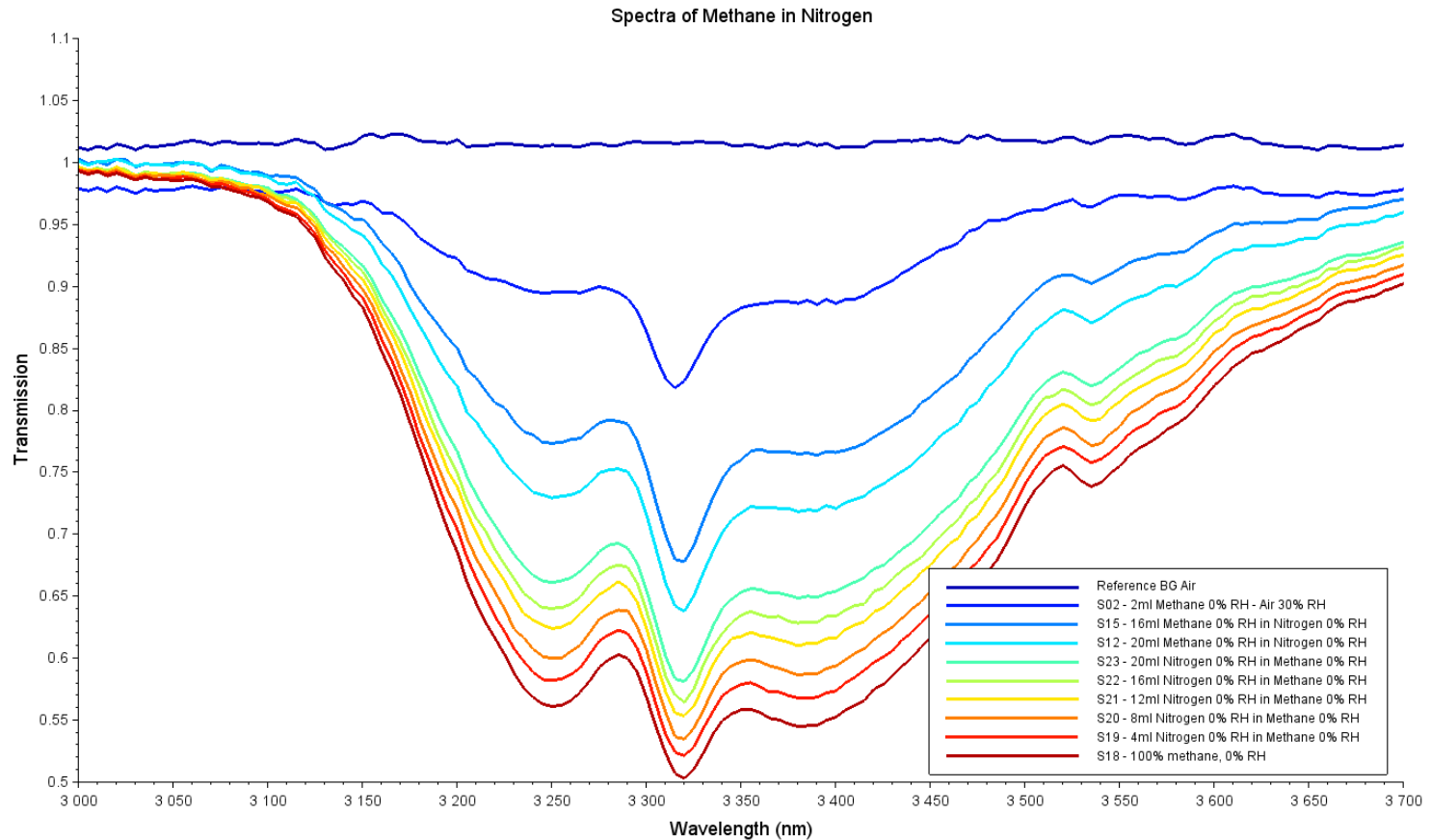
Lab Results



Lab Gas Tests



Lab Results



Results so far

- Spectral data for organic acids from lab testing with Diamond ATR probe.
- Gas measurements for spectra of CH₄/CO₂ in varying concentrations and RH%.
- Now recording first measurements from gas sensor fitted to pilot scale plant.



Thanks for listening



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Project coordinated by the QUESTOR Centre
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