



WASP: WSN for healthy cows and welfare friendly farm management

IST-034963

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Wageningen UR Livestock Research

WSN in the Real World – A Workshop
Barcelona, 28th October 2011

PHILIPS

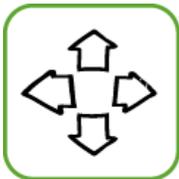
TU/e Technische Universiteit
Eindhoven
University of Technology



Imperial College
London



Why Precision Livestock Farming?



Intensification

Major trend



Animal welfare

Full in discussion



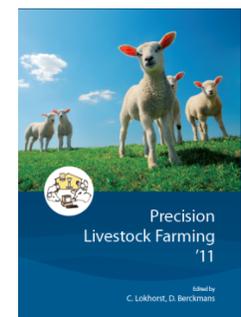
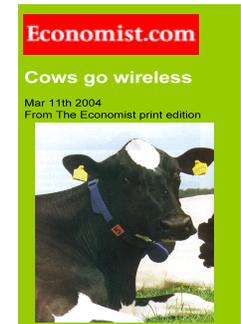
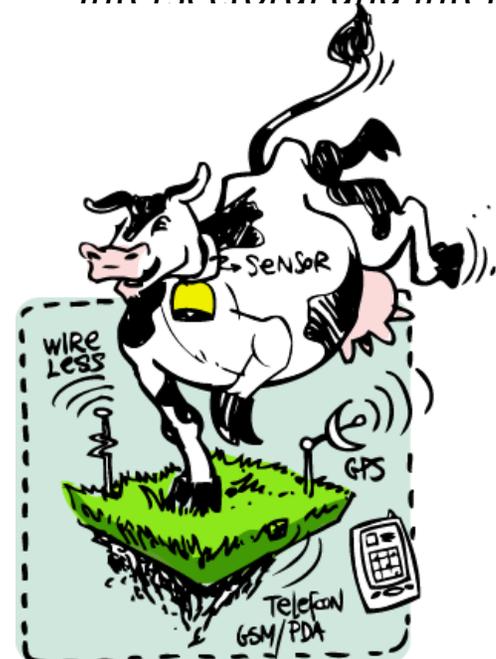
Animal health

From curative to preventive

Technological improvement

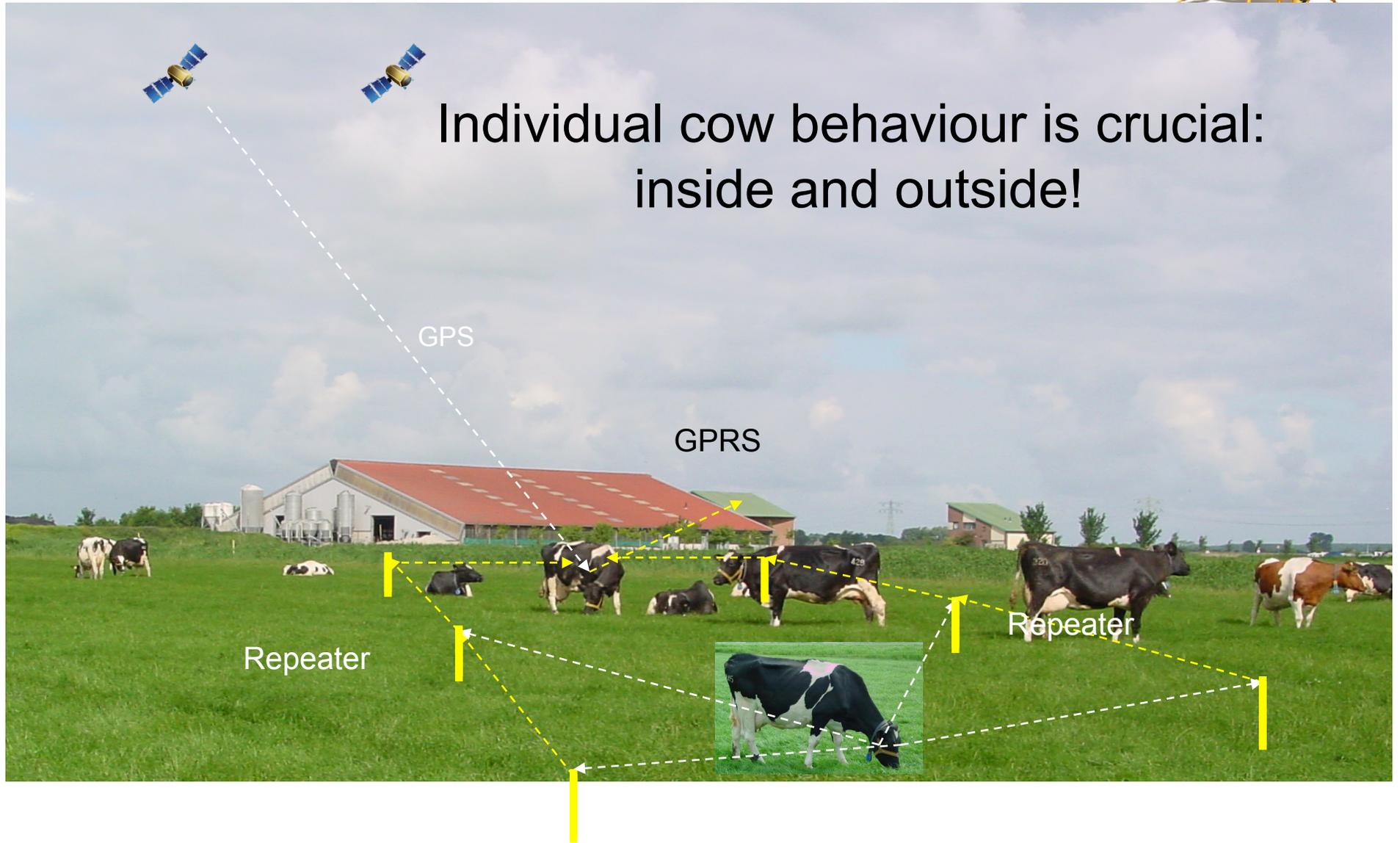
Innovation and knowledge economy

Intersectoral and international





Individual cow behaviour is crucial: inside and outside!



WASP

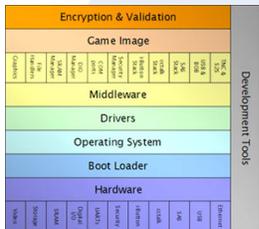
'From sand to applications'



Node platform



hardware & software



Network protocols

WSN services



applications



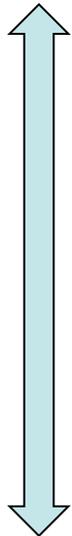
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Partners: TU/e, PHILIPS, WAGENINGEN UR, Imperial College London, GEFES, GEFES-Gesellschaft, STMicroelectronics, INRIA, csem, CPFL, CEFRIEL, ETHZ, SAP, HTM, RWTH AACHEN, UNIVERSITÄT DUISBURG ESSEN, CENTRO RICERCA FIAT, PHILIPS UNIVERSITÄT MARSELLE.

Remote (activity) monitoring of individual cows

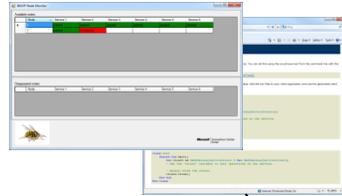


various remote web applications



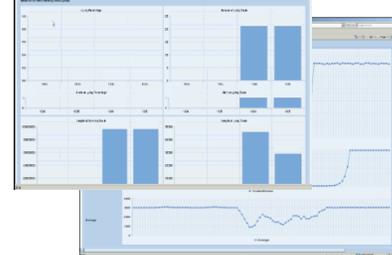
dairy cows wearing (battery-powered) activity sensors with wireless readout

Various tools to easily check deployment (e.g. check quality of wireless communication)



3D viewer for localization of individual cows (and status check of sensors)

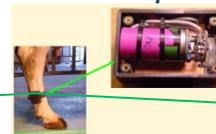
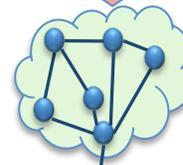
Data storage, analysis, alert generation



Remote application(-s) on PC / laptop (smart phone)



WSN gateway Running on PC



application focus is on **claw health**

by remote monitoring of daily activity patterns i.e.



lying



standing



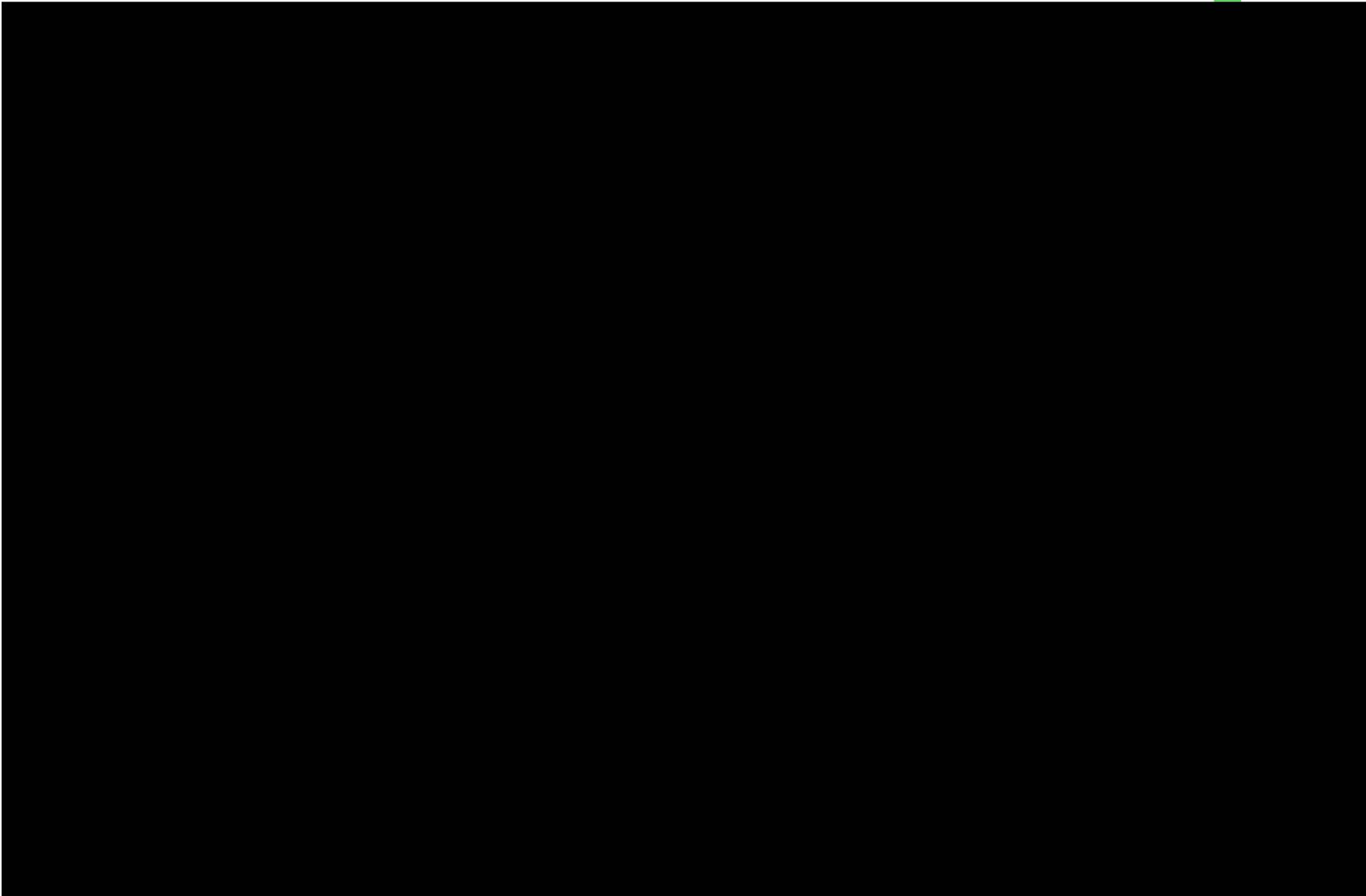
Walking & step analysis



Fun to work together with the cows



Large scale test (79 nodes) with cows in Lelystad



WASP HC test bed and prototype lessons learned



- Reduction of radio traffic:
 - On node classification (mode lying, standing, walking)
 - Circumstances based activation (step detection)
 - Reduction of power consumption (* in simulation and lab test)
- Re-programming of nodes:
 - Updating algorithms
 - Installing additional functionality
- Location awareness:
 - Measure the position of cows (* in demo)
- Scaling effects:
 - Showed large scale deployments with 127 and 79 nodes
 - Customer has to perform detailed analysis of network and node modes





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