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XX congreso internacional
2022

Miquel Collell
Global Swine Technical Director MSD

Smart Farming...
La granja del
futuro





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Granja

- Universidades, Spin-off de universidades
- Start-ups
- Granjeros
- Empresas de equipamiento
- Empresas de software porcino
- Farmaceuticas



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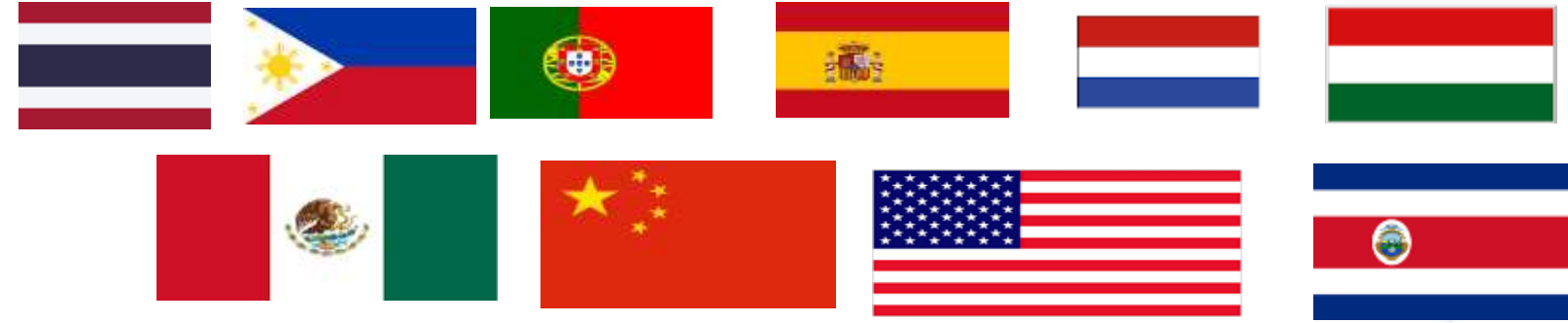


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B-eSecure

Biorisk



p-TRACK



MAXIMUS

Kpi Farm



AGROSUPER



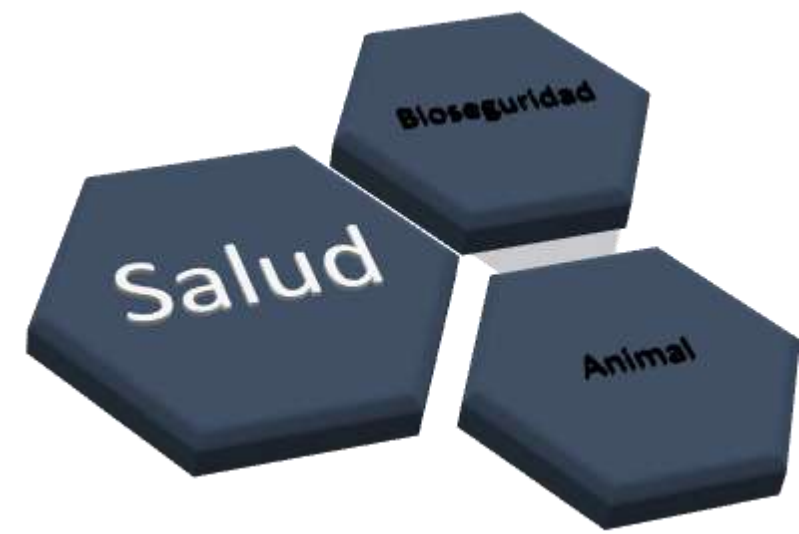


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degre^e



VALIDATION STUDY OF THERMOGRAPHIC CAMERA: PRELIMINARY RESULTS

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INTRODUCTION
Fever as clinical sign in pigs is measured through individual control by different kinds of thermometers. It is a time-consuming procedure and the use of rectal thermometer can be disturbing for animals. Usage of thermography with help of mobile devices for assessing temperature in herds is unexplored and can be a useful tool for vets.

OBJECTIVES
Demonstrate that thermal imaging, obtained through a smartphone adaptable device, and combined with specific software is a quick, non-invasive alternative to reflect body temperature in pigs.

MATERIAL AND METHODS
The validation was made by comparison of rectal temperature of sows with images made with thermographic camera. Room temperature, relative humidity, speed of air, brightness and distance were recorded for each case. We performed measurements in 200 sows located in 4 different farms in East and North-East Spain. The sows were located in individual cages during the first four weeks of pregnancy. The thermographic devices used were two FLIR ONE X cameras (FLIR, USA), for Mac OS and Android, respectively, and images were obtained with an iPhone 6s Plus and a Samsung J2 smartphones. The images were analyzed using FLIR Tools software (FLIR, USA). The body temperature was replicated using electronic digital thermometers (Omron, Spain). Data were statistically analyzed using SPSS v.25 software (SPSS Inc, USA) and applying Spearman's correlation among all parameters (joint sows, as well as maximum temperature recorded by thermographic camera, considered significant when $p < 0.05$).

RESULTS
Both camera and smartphones used provide images with enough quality to be analyzed by means of FLIR Tools software, whenever the kind of image obtained in the examples image marking highest temperature (left) and "true" image (right).

CONCLUSIONS
Data from FLIR One for Mac OS or for Android did not show correlation with any of the microclimate factors recorded. Temperature varied between 18°C and 27.9°C, humidity between 44% and 75% and brightness between 38 and 1300 lux.

DISCUSSION AND CONCLUSIONS
Several studies regarding thermographic camera application in pigs have been performed, obtaining those images with rectal temperature and microclimate factors with different results in pigs and other species. In this study, the results obtained in this study, between 0.4 and 0.20% correlation with rectal temperature were not significant. The results did not support the value area in the most adequate thermal window for pigs and the use of smartphone device offered similar results with high correlation between smartphone and digital thermometers. The results did not support the value area in the most adequate thermal window for the measurement of correlation regarding any part of the sow and not really to use the camera.

KEYWORDS
Correlation coefficient (r) 0.40 0.20
Significance $P < 0.0001$ $P < 0.0001$

This images obtained with iPhone and FLIR ONE for Mac OS showed higher correlation than those obtained with Android device and smartphone.

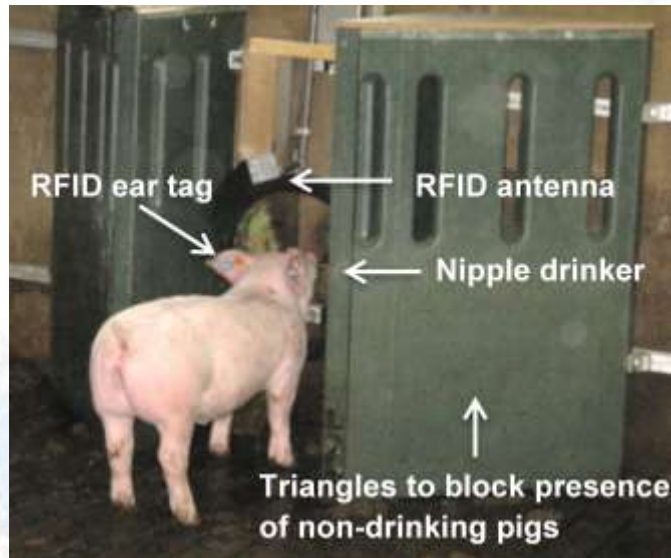
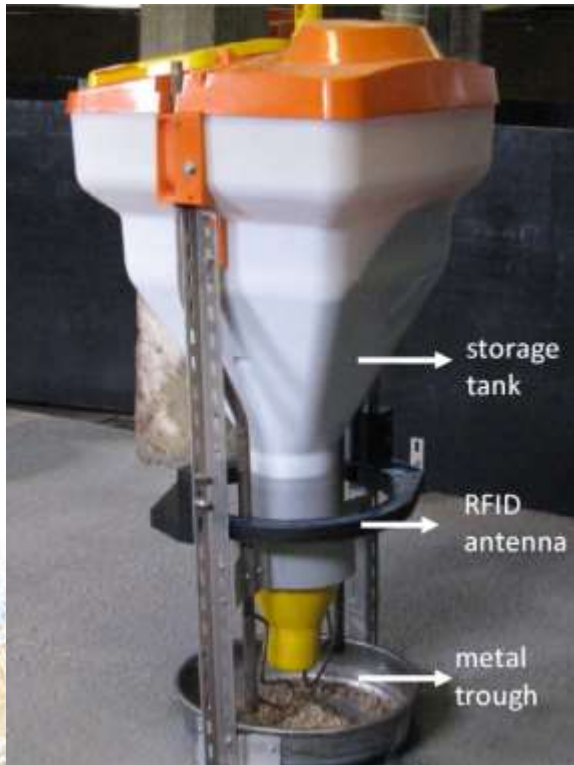
REFERENCES
1. Ramír G, Sánchez P, Ubeda JL. (2021) Validation of thermographic camera for the detection of fever in sows. *Journal of Thermal Analysis and Calorimetry*. <https://doi.org/10.1007/s12014-021-02408-4>

EXPORES-0126



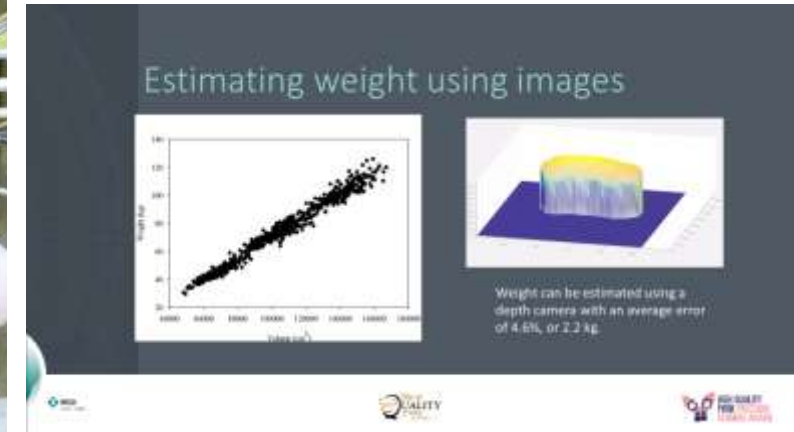
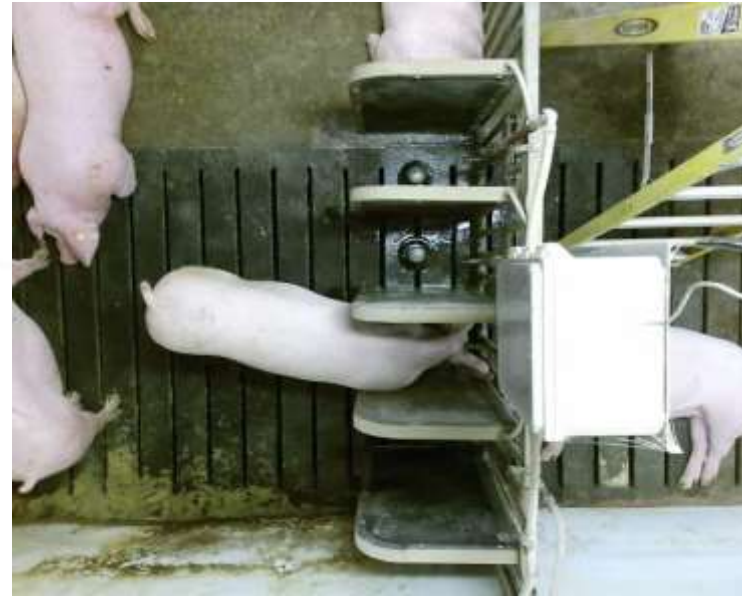
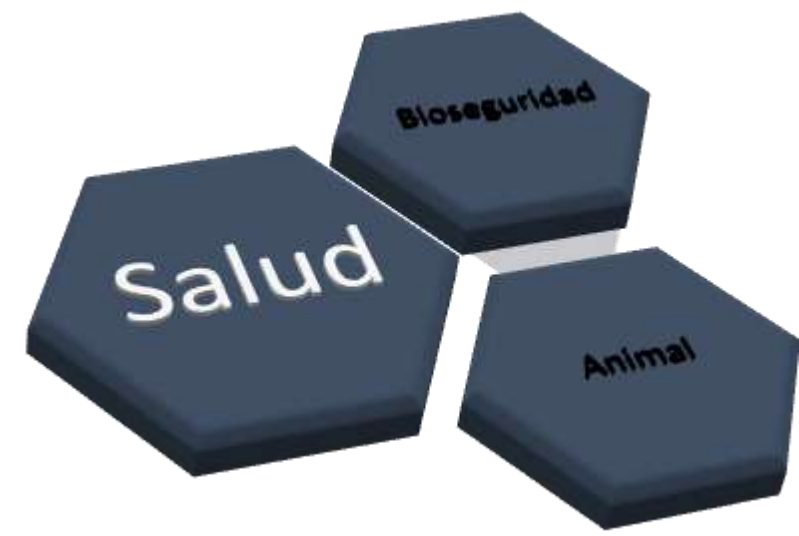


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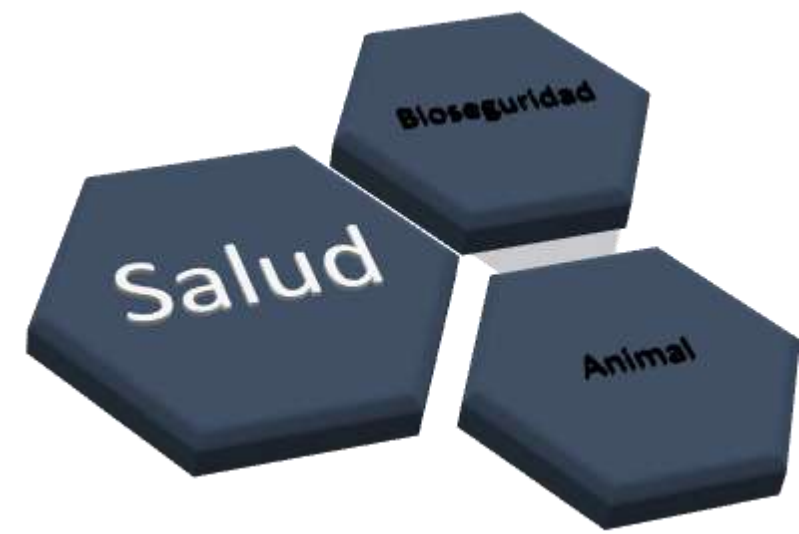


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IDAL^{3G}



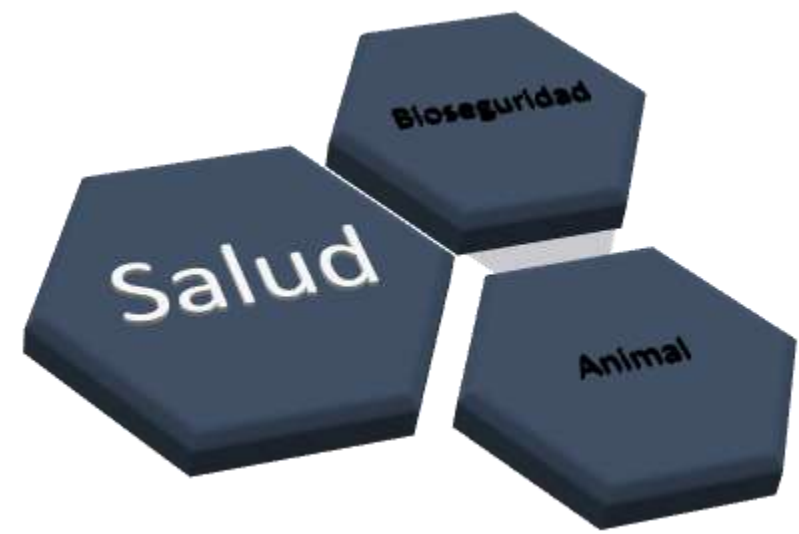


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OPP group
COMMITMENT TO EXCELLENCE





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FEEDVIEW

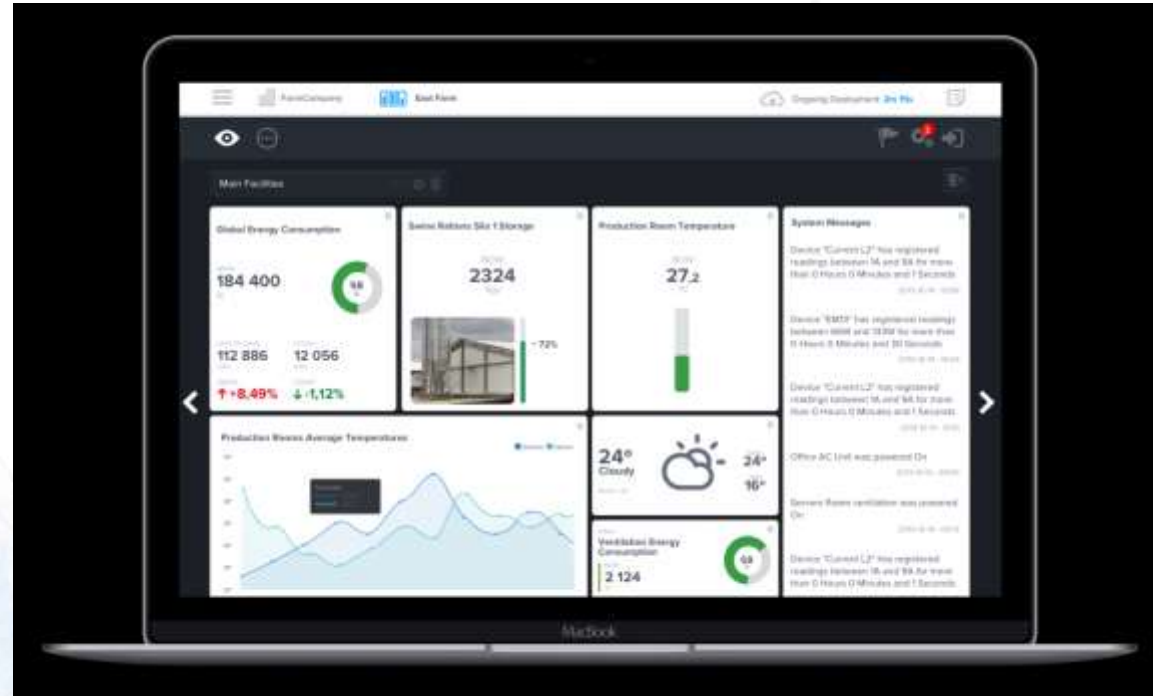


FANCOM[®]
forward thinking





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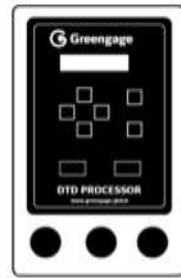


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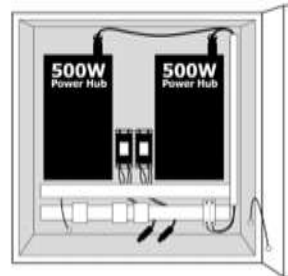


Swine shed

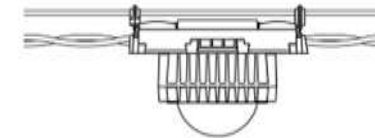
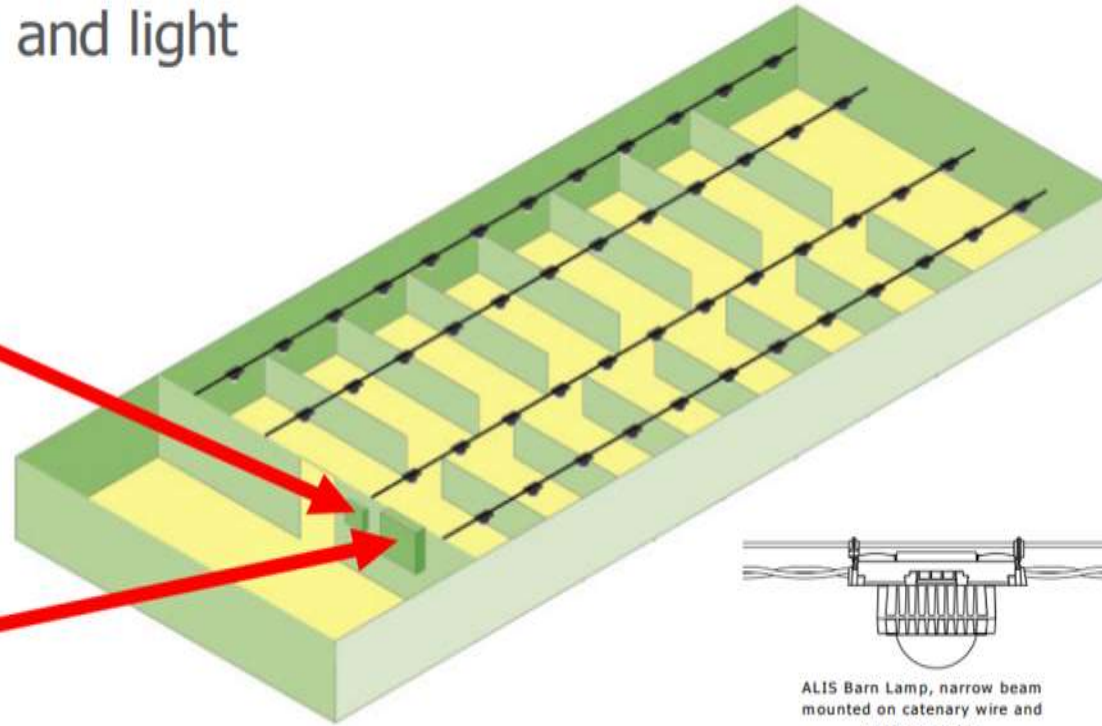
Power, control and light



DTD Control Panel V1.8



ALIS Power Hub Panel (2 channel)



ALIS Barn Lamp, narrow beam
mounted on catenary wire and
ALIS Bus cable



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Optimat

MULTIPHASE FEEDING SYSTEM



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EFS para cerdas





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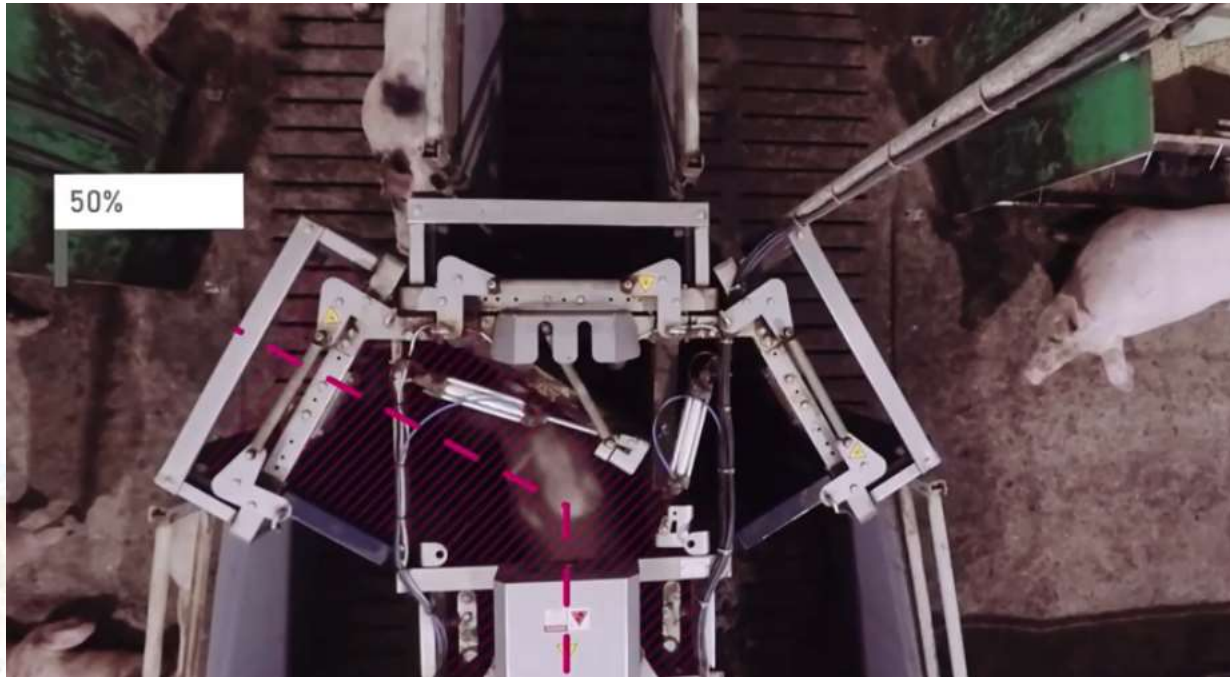


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pigChamp[®]
pro europa



PORCITEC

PIGKNOWS

AGR/NESS



MetaFarms

INFOPORK

PORCI CONTROL

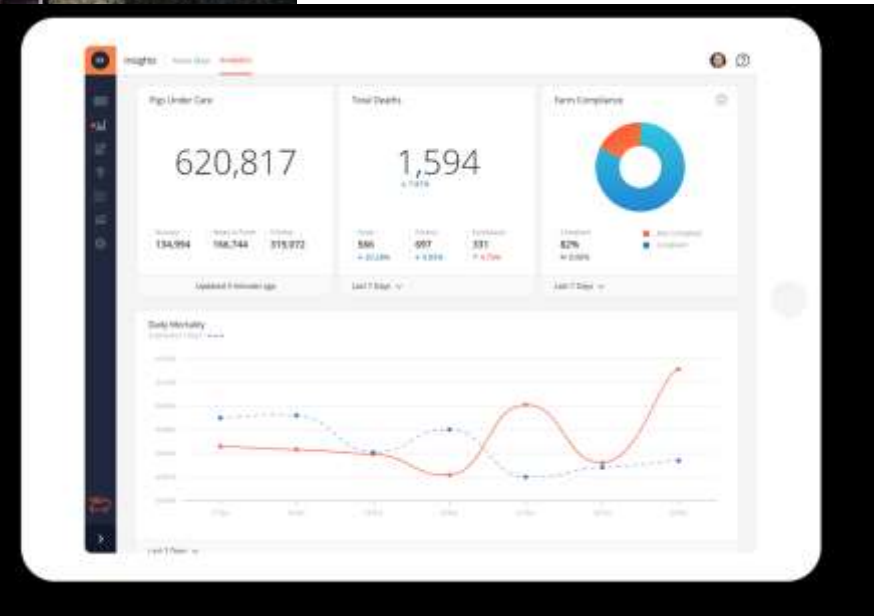
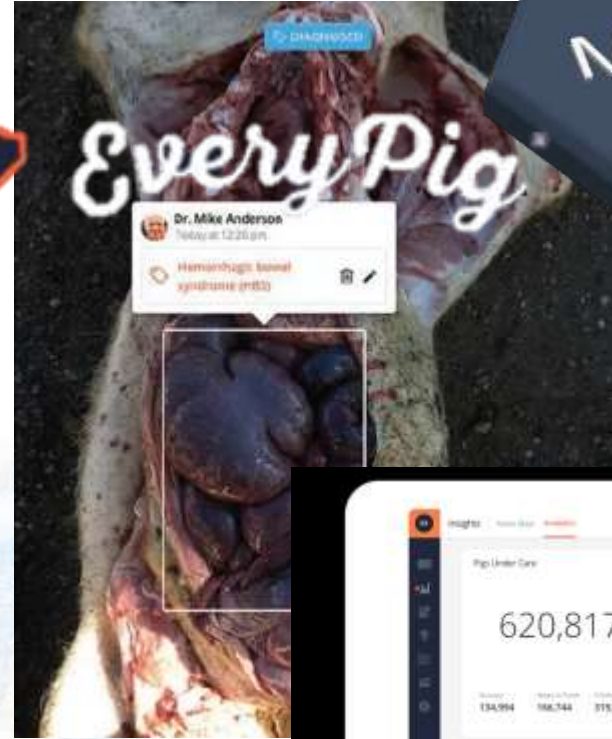


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SaniTRAX

Powered by
pigChamp





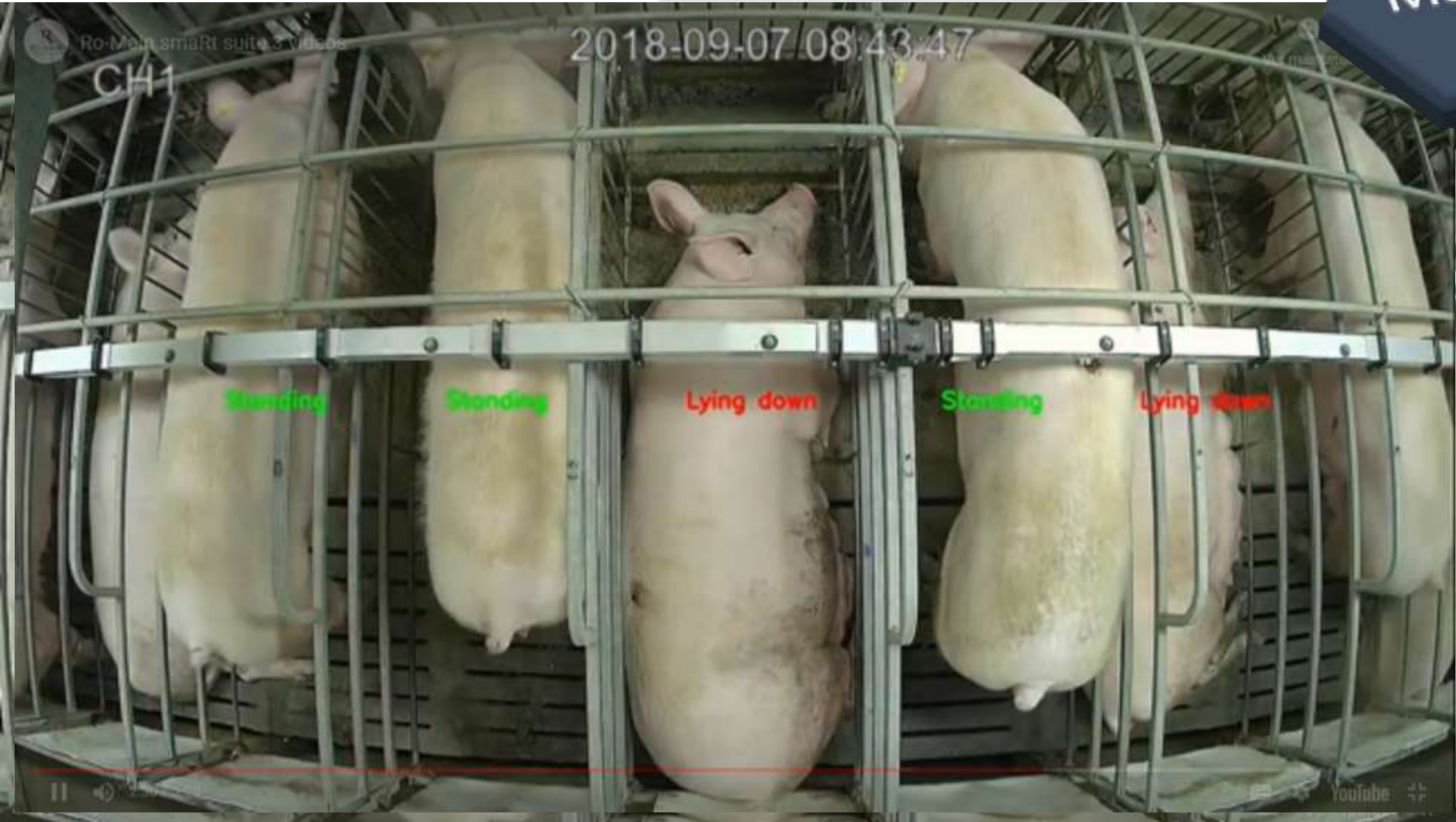
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RO-MAIN
Agro-Technological Products and Solution



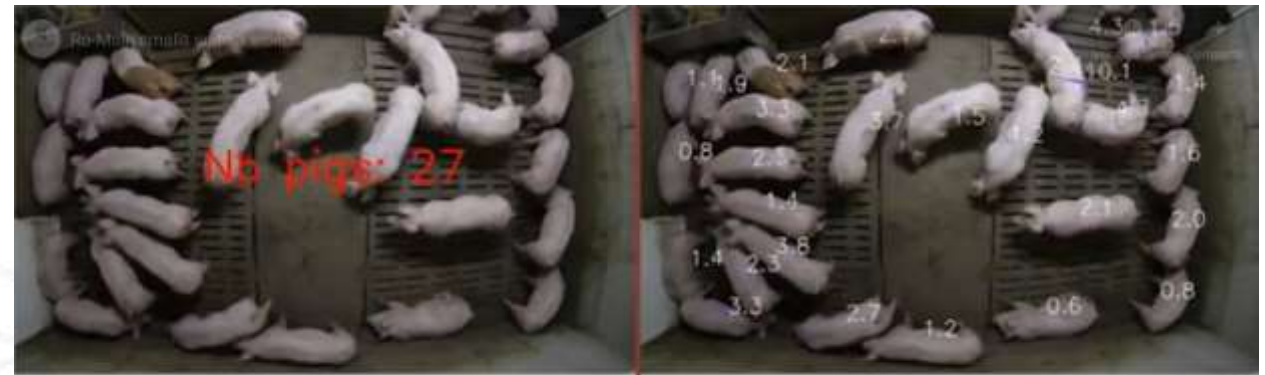


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Ro-Main smaRt
suite

Lead the herd.



Supported by a camera network, the artificial intelligence algorithms observe each enclosure

The camera network and the artificial intelligence algorithms locate and track each pig individually

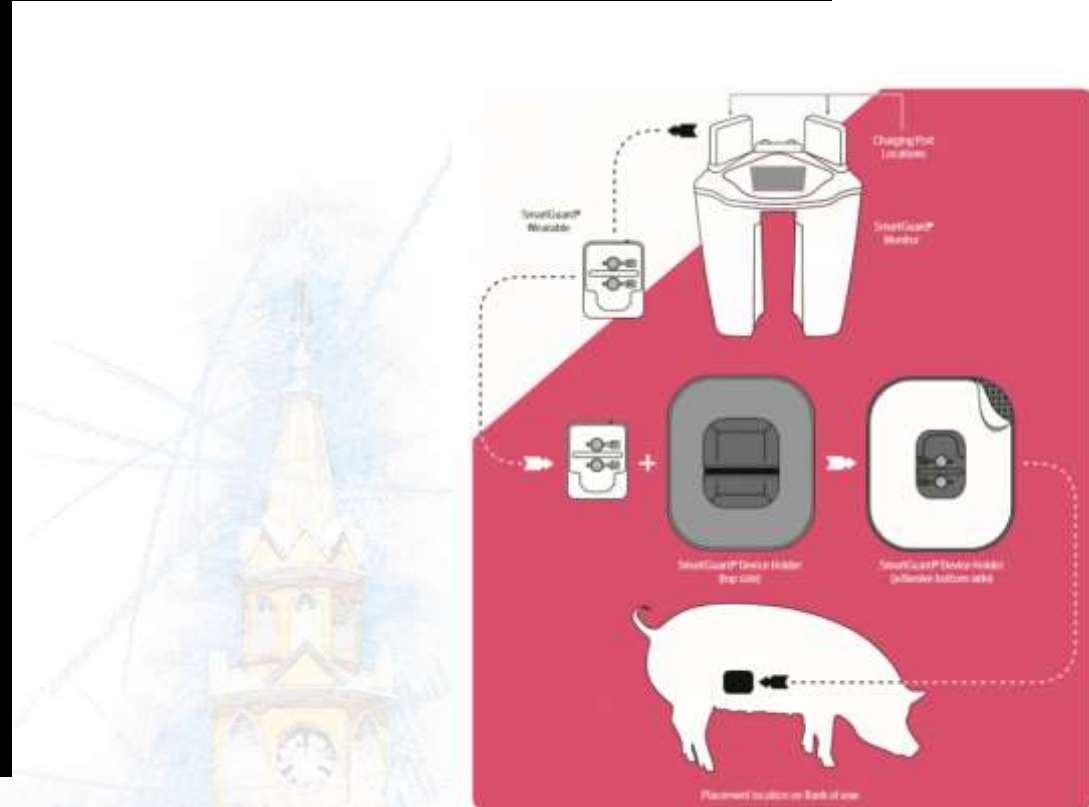
smaRt Inventory

smaRt Tracking





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LUDA FARM
Smart farming made easy





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SERKET



House [Add New Entry] [Search] [Filter] [Export]

ID	Members	Weight	Age	Status	Last updated
IC03P	14	14	14	Healthy	9/12/2017
IC03P	14	14	14	Healthy	9/12/2017
IC03P	14	14	14	Healthy	9/12/2017
IC03P	14	14	14	Healthy	9/12/2017
IC03P	14	14	14	Healthy	9/12/2017
IC03P	14	14	14	Healthy	9/12/2017
IC03P	14	14	14	Healthy	9/12/2017
IC03P	14	14	14	Healthy	9/12/2017
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IC03P	14	14	14	Healthy	9/12/2017
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IC03P	14	14	14	Healthy	9/12/2017
IC03P	14	14	14	Healthy	9/12/2017
IC03P	14	14	14	Healthy	9/12/2017
IC03P	14	14	14	Healthy	9/12/2017
IC03P	14	14	14	Healthy	9/12/2017
IC03P	14	14	14	Healthy	9/12/2017

Pen C03P09 Cam C042

Performance

Physical Activity: 100%
Social Behavior: 100%
Appetite: 100%
Feeding Activity: 100%
Drinking Activity: 100%

Historical Data

Last 5 months | Export

Month	Physical Activity	Social Behavior	Appetite	Feeding Activity	Drinking Activity
Feb	60%	50%	60%	60%	60%
Mar	80%	60%	70%	70%	70%
Apr	85%	70%	80%	80%	80%
May	80%	80%	80%	80%	80%
Jun	80%	90%	80%	80%	80%
Jul	80%	90%	80%	80%	80%



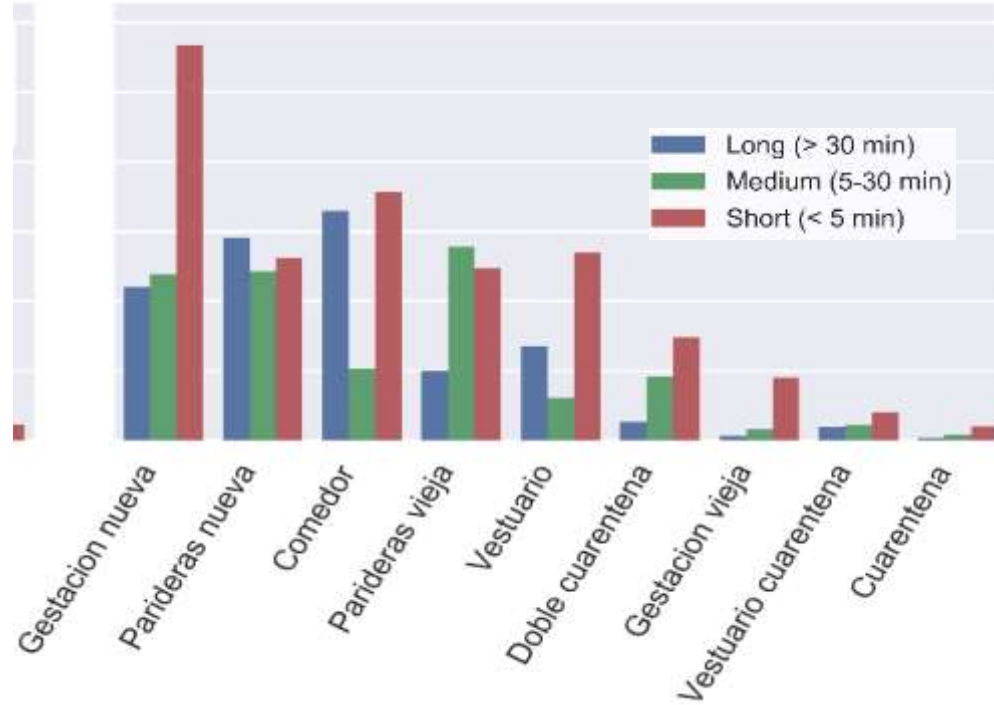


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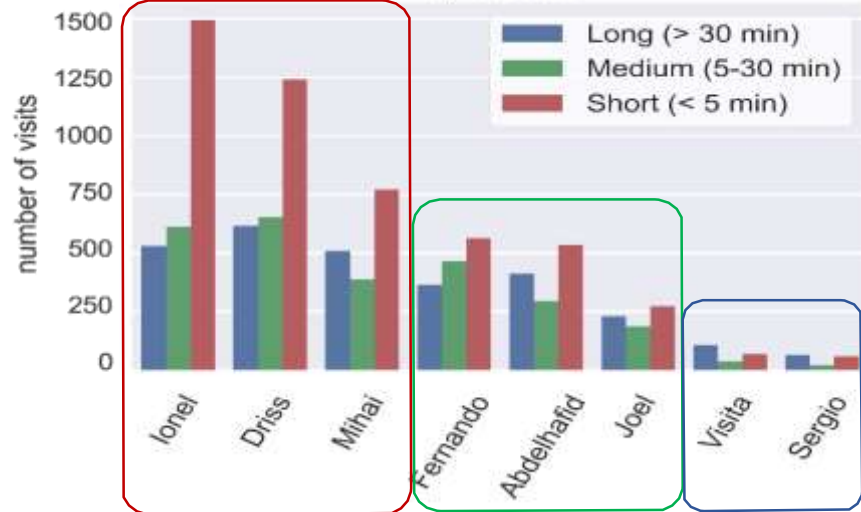




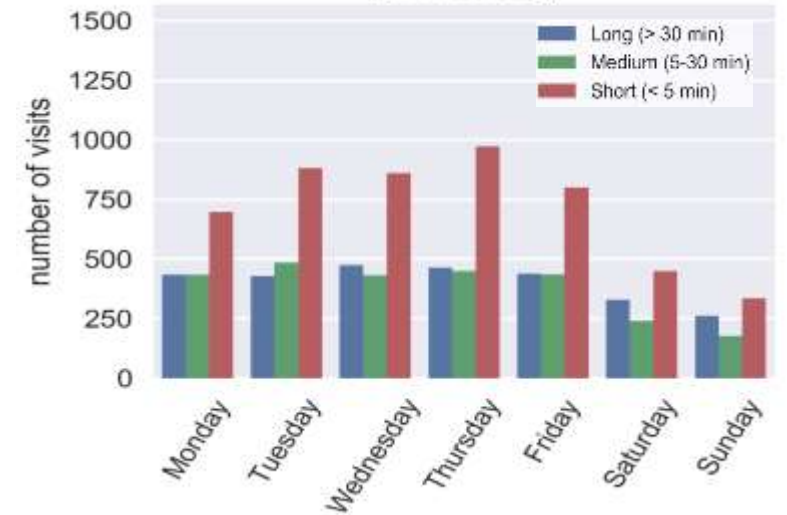
by zone



by worker



by weekday





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