

"Grading Chickens"

Data driven Image Processing for the Poultry Chain

Ir. Hans Izeboud, director Aris b.v. Eindhoven



NVTL-Studiedag, Wageningen, March 8th 2016

Presenting



Aris bv Vision & Robotics

- Started in 1990
- Eindhoven, centre of Brainport
- Focus on Machine Vision for Agri & Food sector
- More than 750 Camera Systems worldwide
- Chainwide gathering data for "controlled growing"
- Combination of standard hardware and own developments
- Specialized in software
- Specialized in cooperation
- Focus on Product

Motto: Understanding by Identification

Ursus Wehrli's "Tidying up pine branch"





©Ursus Wehrli



Pikoplant mp0901 coprx 201127 g



Understanding by Identification







Understanding by Identification

Ornamental chain: phalaenopsis, anthurium, rose

Vegetable chain: tomato, pepper, cucumber Meat chain: poultry, pig, cattle



Zeelsterstraat 80 5652EL Eindhoven The Netherlands t +31(0)40 212 74 66 e info@arisbv.nl i www.arisbv.nl y www.youtube.com/arisbvnl

1 /

ARIS

ArisVision in the Meat Chain ...



Inspired by Christien Meindertsma: PIG 05049



PIG 05049: 103,7 kg Skin: 3kg Fat: 5,4 kg Meat: 54 kg Bones: 15,2 kg Organs: 14,1 kg Blood: 5,5 kg Miscileneous: 6,5 kg

At least185 different products are made out of one pig

More pig info: TED talk Christien Meindertsma "The world is running on pigs"



ArisVision in the Pig Chain !











- DeboFlex, project for automation of pig slaughtering (2010-2014)
- Cooperation with Marel Meat Processing, Eindhoven University
- Starting with feasibility of automatic removal of blood meat, abscesses, skin and fat













SmartCount

- Started in 2011
- PasReform: exclusively cooperation in poultry hatchery
- Counting and controlling
- Capacity > 60.000 chicks / hour
- High accuracy < 0,2 %
- Reporting per batch
- Better efficiency, better uniformity, better animal wellfare
- Next generation state of the art poultry grading solution
- Satified customers





















Candler

- Started in 1990
- Storteboom: first customer
- One leg handling
- Grading poultry on visual defects: red and blue bruises, skin damage
- A / B selection
- Capacity 6.000 birds / hour
- Performance ok (!)
- Aris Recognition Module for Learning
- Expensive and slow hardware (386)
- No software available when started





AQS

- Started in 1992
- Stork PMT: exclusively cooperation in poultry processing
- Two leg handling
- Grading poultry on visual defects: red and blue bruises, brokenen wings, litter, skin damage, remaining feathers, epidermal damage
- Capacity 12.000 birds / hour
- Overall performance > 75%
- Improved hard- and software





IRIS

- Started in 2010
- Marel Stork Poultry Processing: exclusively cooperation in poultry processing
- Grading poultry on visual defects: red and blue bruises, brokenen wings, litter, skin damage, remaining feathers, epidermal damage
- Capacity 18.000 birds / hour
- Overall performance > 98%
- New hardware, new LED lighting, new software
- Next generation state of the art poultry grading solution
- Satified customers



Technical design choices IRIS



- Open to innovation, extendible platform
- Deploy multi core technology
- Linux OS and server platform
- Software based on Aris experience using C++, OpenCV, Qt and Linux tool chain
- Use of standard services MySQL, FTP
- GigE camera interface
- LED lighting and controller
- 12 Core PC (* > 25.000 since start!)



ArisVision Software Architecture for IRIS



- Worker design
- Filter-per-defect allows team development and optimal performance per defect
- 'Serial' programming in worker, no threading, no multiprocessing libraries
- Picture-In result-Out: easy to test



ArisVision in IRIS in Practice







ArisVision in IRIS in Practice



Summery and Discussion

- There is fast growing role for intelligent camera systems in the poultry chain
- Data for poultry growing and processing can be collected easily with camera's
- Connecting links in the poultry chain offers advantages throughout the chain
- Internet of Things, Internet of Plants, Internet of Poultry?

