

SMART CAMERA TO MEASURE COIL DIAMETER

ECE Design Team #5

BACKGROUND:

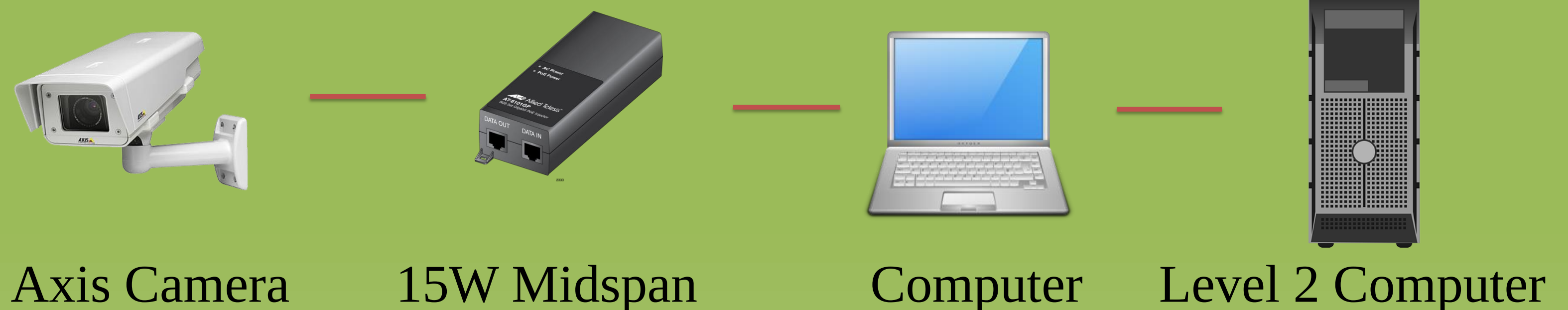
ArcelorMittal is one of the world's leading steel manufacturers. The main goal is to produce safe, sustainable steel for automotive, construction, household appliances and packaging. ArcelorMittal is a globally renowned company.

ArcelorMittal requests a way to accurately measure the diameter of the steel coil that is on the #5 Pickle Coil Line in East Chicago to improve productivity and yield. The current Programmable Logic Controller estimation of the diameter is not adequate.

DESIGN:

The solution is to use the Axis Communications P1355-E Camera to capture live high quality video of the steel as it is being coiled at the end of ArcelorMittal's #5 Pickle Coil Line. The Axis Camera is paired with a host computer. We feed that video into a smart camera, computer vision, software design solution which can accurately measure the increasing diameter by pixel analysis. This communicates the measured diameter to the production control computer.

HARDWARE LAYOUT:



SOFTWARE:



RESULTS:

The system can precisely measure a simulated coil to an accuracy of 0.14%. This is approximately 6.8x better than the requirement given by ArcelorMittal.



Original Image



Processed Image

COMPONENT LIST:

Axis P1355-E Network Camera
15W PoE Midspan Injector
CAT5e Ethernet Cables
Windows 7 Desktop Computer
MATLAB/Simulink Software
OpenCV API Computer Vision



Team Members: Joe McAuliffe
James Quaglia
Ian Siekkinen
Petros Taskas
Matt Wesolowski
Poyuan Han

Sponsor: ArcelorMittal
Project Lead: Carlos Forjan
Facilitator: John R. Deller, Jr.

