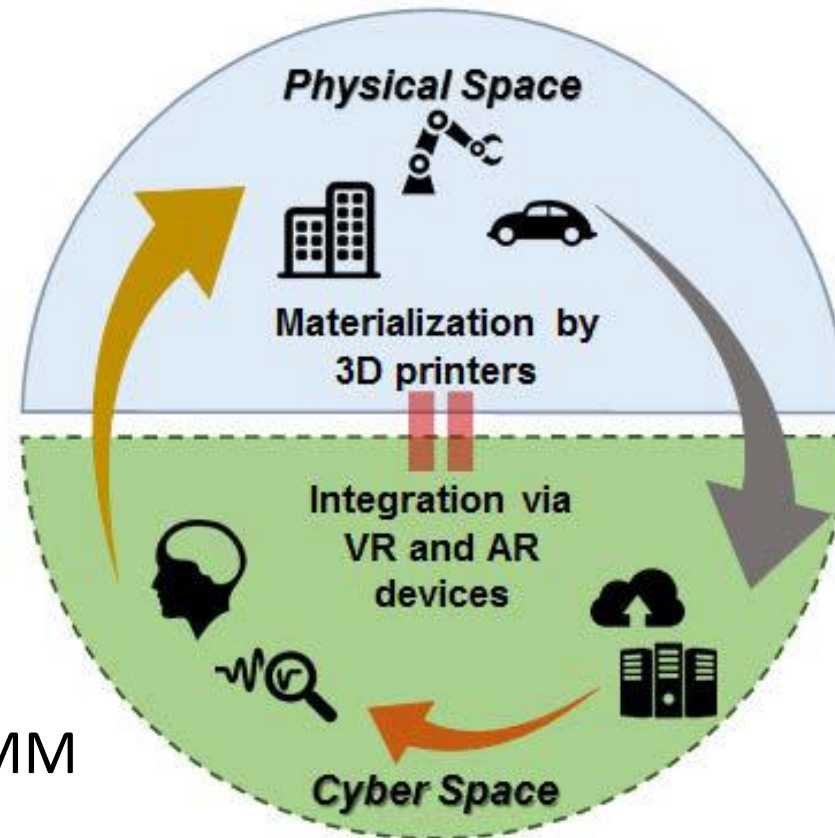


Από Industry 4.0 σε Society 5.0

Εφαρμογές με
μηχανές & ρομπότ



Συλλογή δεδομένων με
αισθητήρες & συσκευές

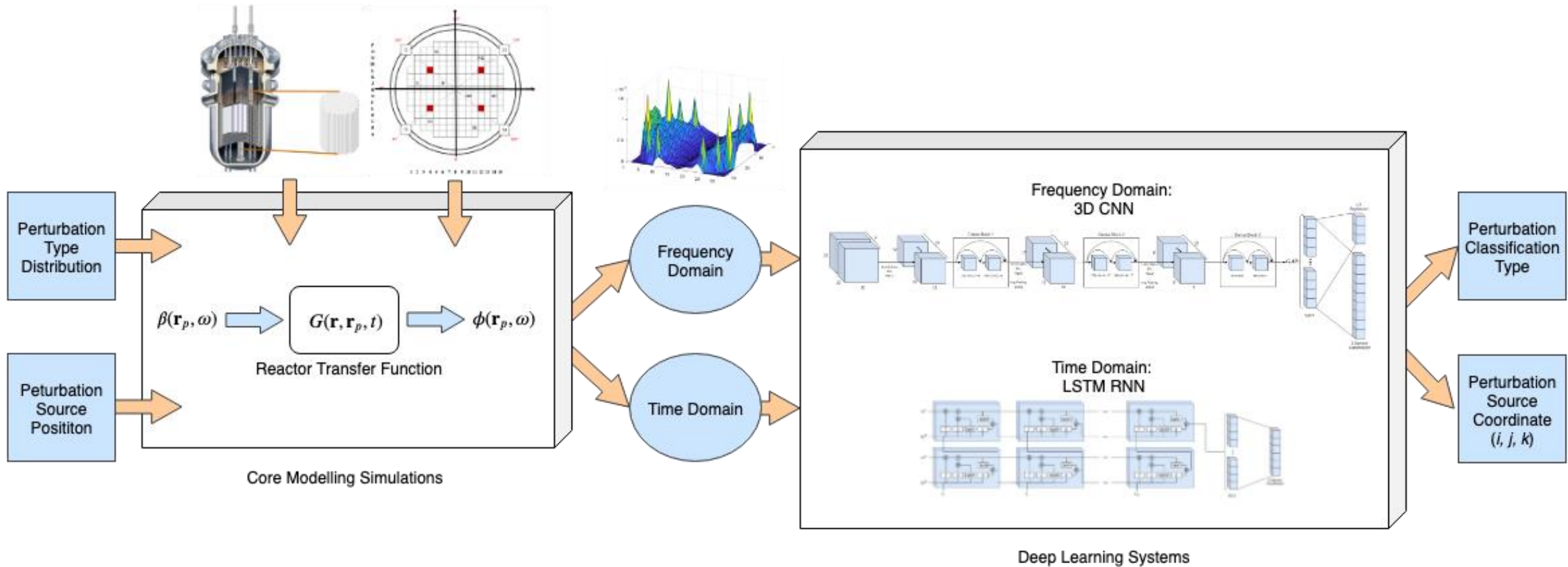
Ανάλυση με τεχνικές TN, MM

Συσσώρευση
Μεγάλων Δεδομένων

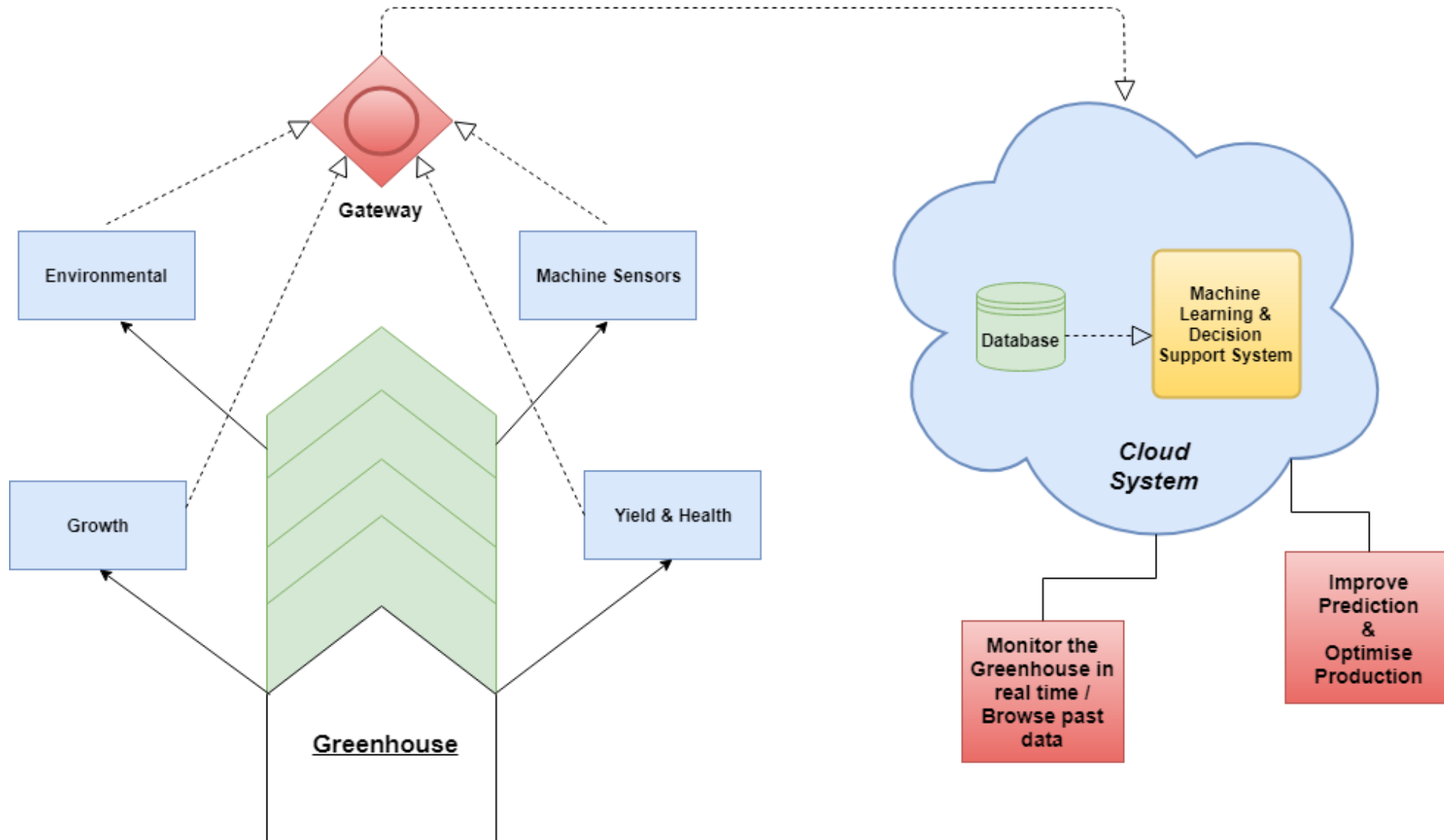
Εφαρμογές ΜΜ/ΤΝ

- **Βιομηχανικά περιβάλλοντα: Πρόβλεψη Βλαβών**
 - Siemens Gas Turbine ML/DL Data Analysis
 - Nuclear Power Plant DL Signal Analysis
- **Λειτουργικά περιβάλλοντα: Έλεγχος & Βελτίωση Παραγωγής**
 - Smart DL/AI AgriProduction Prediction
 - Intelligent Refrigeration Systems - Large Energy Supermarket Cuts
 - DL based OCR in Food Packaging – Date/Ingredient Verification
 - Environmental Sensor Data Analysis - Water/Rainfall Prediction
- **Κοινωνικά περιβάλλοντα: Υγεία, Ευημερία, Πολιτισμός & Δημιουργικότητα**
 - Analysis of Ambulance Calls, Fall Detection of Elderly,
 - Parkinson's / Alzheimer's/ COVID-19/ Cancer Diagnosis
 - Cultural object data (from GLAMs) Re-use

Core Monitoring Techniques and Experimental Validation and Demonstration

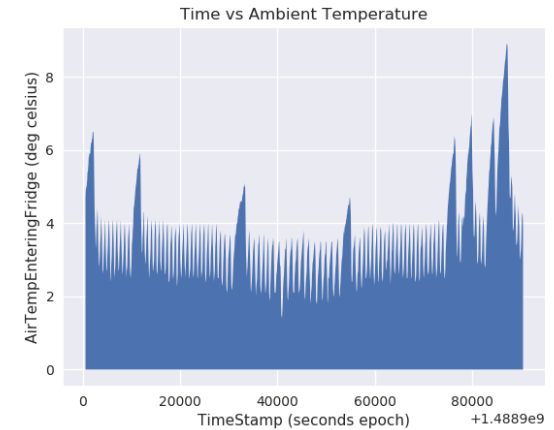
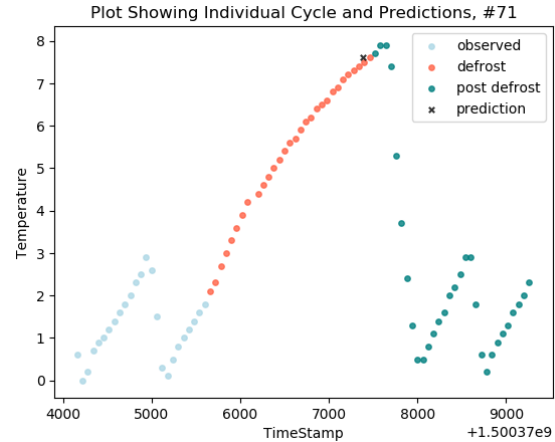


Smart agri-food using Machine & Deep Learning



Intelligent Refrigeration Systems

- *Cut energy costs down*
- *React to demands of NationalGrid*
- *Massive IoT network of Fridges/Freezers*
- *Optimise defrosting cycles, accounting for thermal inertia pertaining to food*



Experimental facility

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Energy industry

Cool running: supermarket fridges could help power UK

Tesco trials show chiller aisles offer possibility of being 'virtual battery' for National Grid

Jillian Ambrose
Sun 23 Apr 2019 15:51 BST
248

▲ Complex algorithms, developed by the software firm IMS Evolve, can temporarily cut the electricity supply to fridges when needed while still keeping the food cold. Photograph: Simon Dawson/Bloomberg

Supermarket freezer aisles could soon help power the National Grid after

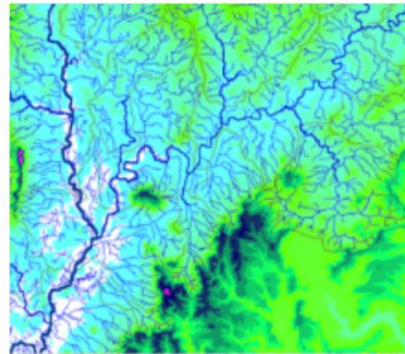
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Engineering Transformation for Integration of Sensor Networks

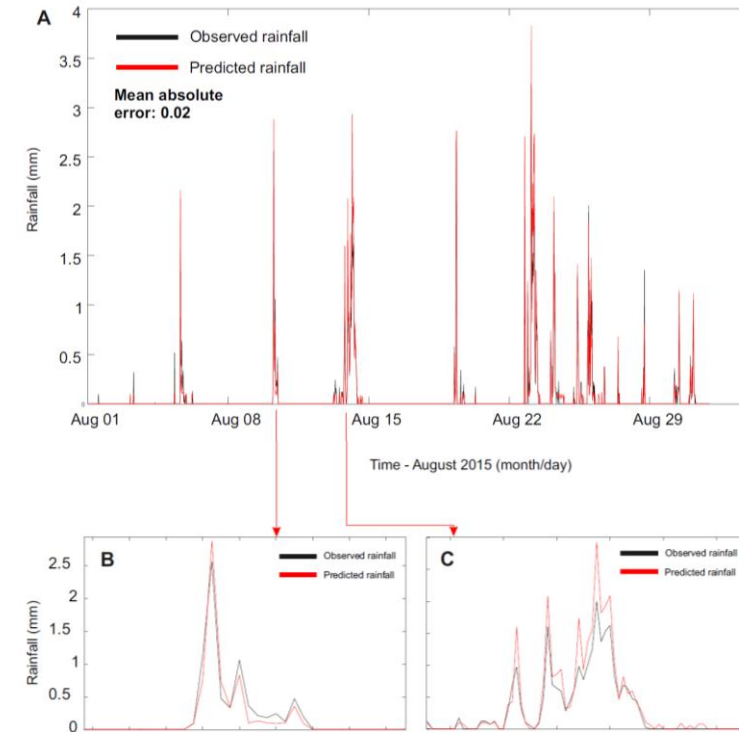
- Integration of sensor network data
- Soil moisture monitoring & prediction
- Enhance environmental observations
- Understand environmental drivers, pressures, status



Enhancing the COSMOS-UK network with new measurements



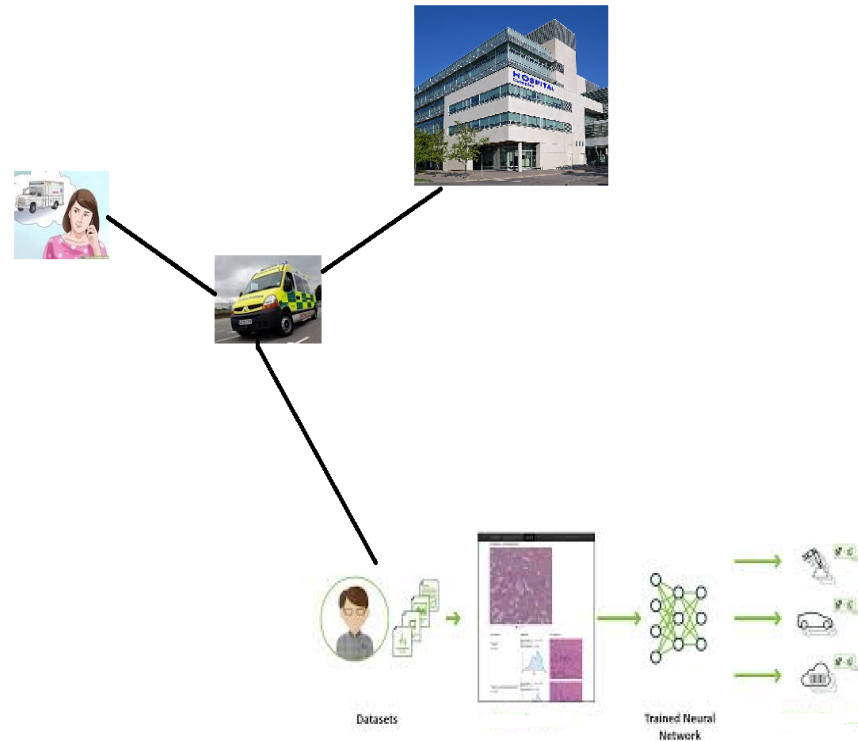
Linking sensor monitoring sites using digital rivers



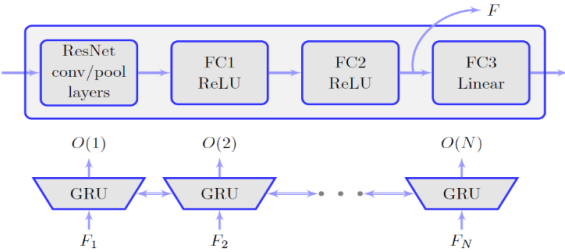
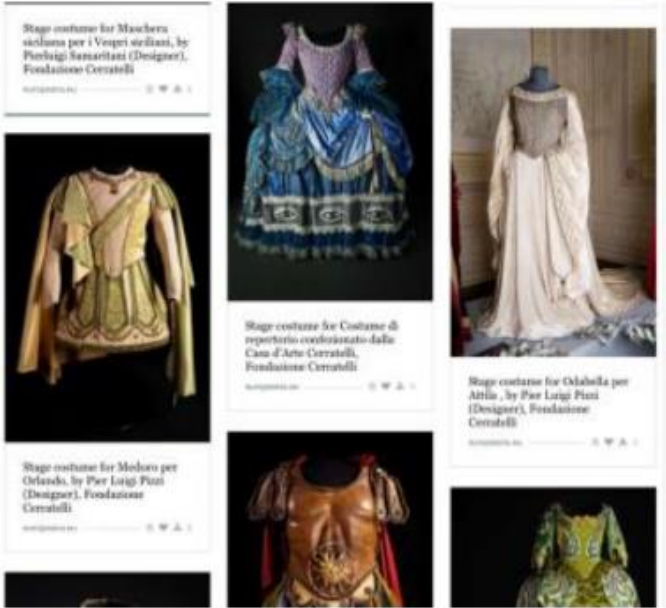
Rainfall and preliminary predictions of rainfall for August 2015 from the site North Wyke (NWKY).
A. Level 2 rainfall (black) and predictions from machine learning models (red). Over the month, mean absolute error is 0.02. **B & C.** Details of the predictions on rain events from A.

Machine learning for predictive modelling of Ambulance calls to Care Homes

- **Target:** use ML/DL to explore demographic & clinical predictors of ambulance attendance and conveyance to hospital for people residing in care homes



Enrich & Creatively Re-use Content for Cultural Heritage with AI/DL

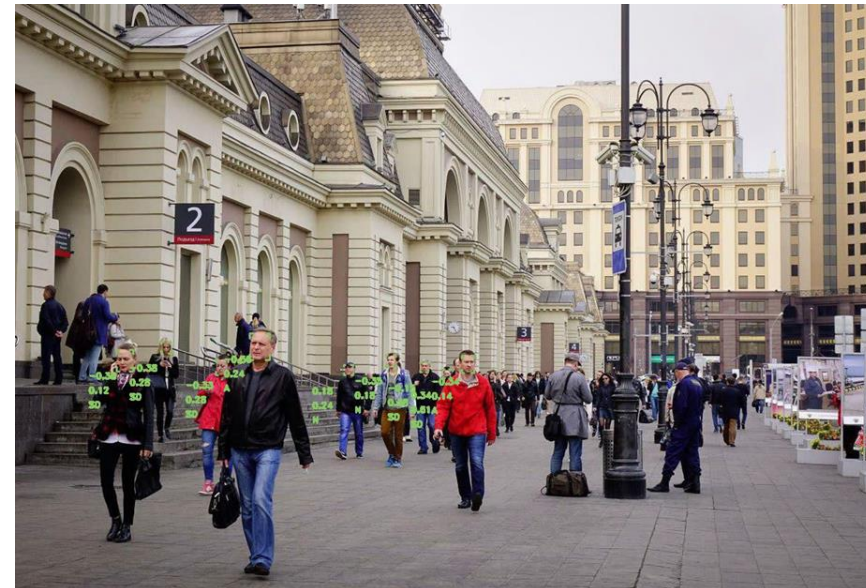


Video Understanding & Automated Annotation

- **Target:** Use DL/AI methods for Object/People/Behavior/Place/ Concept Extraction and Automatic Annotation, through visual, speech & text analysis

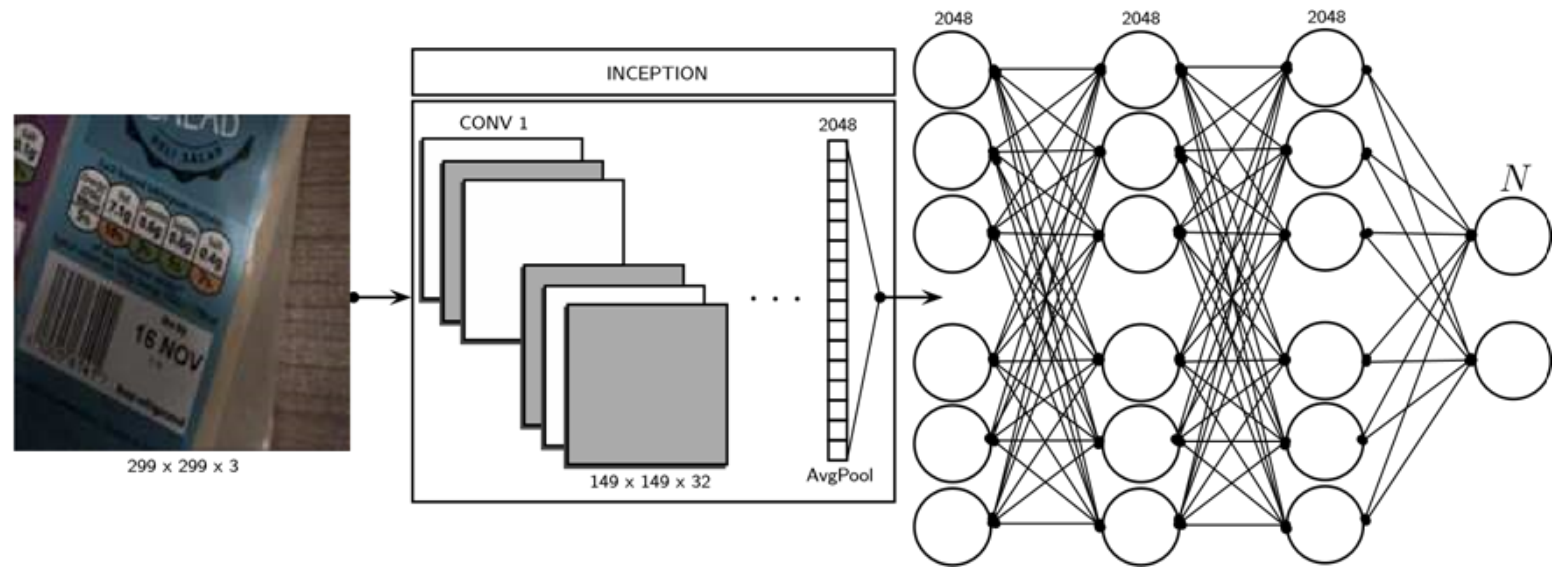


We then use the carbox parked in a field as the last step to clear the site of woods. Next we see three girls in a white field outside the carbox sitting in a row. It goes across the middle of the road. The next section shows the man walking on the road and entering in the site. One of the men is also walking and going to the water behind a tree. There are high water tanks in the carbox before we return to a car and see the man with an small motor boat. Further along and entering the field we see the grass field at a camp and see that they have been joined by other friends including the actor Max Baucus and his wife. Back on the water boat the man about in a white and black and black for the camera. The final section shows further scenes of the camp and an interior shot of a large church.



Deep Learning for Optical Character Verification of Food Packaging Images(UoL, NCFM, OAL, 2017 - 2019)

- **Target:** use DL for real time visual analysis and optical character verification of food packaging images
- **Participants:** 1) School of Computer Science UoL 2) UK National Centre for Food Manufacturing 3) OAL Company 4) users: Tesco, big supermarkets.



Deep Learning for predicting Parkinson's Disease from MRI & DaTScans (UoL, NTUA, G. Gennimatas & Lincoln Hospitals)

- **Target:** use DL to analyse medical imaging (MRI, DaTScans) & clinical information for predicting Parkinson's disease providing transparency, person & domain adaptation.
- **Datasets:** Different datasets created and/or used (NTUA/UoL; PPMI)

