

<https://sii.anu.edu.au/>

Business AI Applications

WASBC — AI for a Nation — 3 September 2021

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Australian
National
University

Software
Innovation
Institute

Let's Recap!



"AI" is already embedded in many of our daily interactions.

- **50's** Search => Neural Networks
- **80's** Knowledge Representation and Expert Systems => Kakadu + Esanda
- **90's** Intelligent Agents => Deep Blue and Online Assistance (Dialog + Expert System)
- **10's** Data/Compute => Deep Neural Networks
- **20's** Knowledge Graphs, Reasoning => Cybernetics = Human and Artificial Intelligence
- **??'s** Artificial Intelligence – Really?



Examples of AI Today

- Computer Vision
 - Data Centre Security
 - Autonomous Vehicles
 - Image Enhancement
 - Background Removal
 - Facial Recognition
 - Photo Colorisation
 - Number Plates
 - Counting Crowds
 - Medical Imaging
- Natural Language
 - Speech to Text
 - Text to Speech
 - Translation
 - Document Summary
 - Language
- Understanding
 - Social Network Influence
 - Maps
 - Tax Return Assessment
 - Medicare and PBS Fraud
 - Recommendations
 - Personalisation
 - Weather Forecasting
 - Web Anomaly Detection
 - Electricity Utilisation
 - OCR

So Much AI Technology. So Little Time.

<https://mlhub.ai/survivor/>



Accessing AI

- Transparency of AI Models
- Share AI Research Outcomes
- Reproducible Research
- Large Shareable Models
- 5 Minute Experience

The machine
learning hub

\$ pip3 install mlhub mlhub.ai

```
gjlw@yoga: ~
$ ml available
The repository 'https://mlhub.ai/' provides the following models:

animate      2.1.5  Tell a data narative through animations
audit        4.1.0  Classic financial audit predictive classification model.
azanomaly    3.1.4  Azure Anomaly Detection.
azcv         2.6.0  Azure Computer Vision.
azface       2.1.4  Azure Face API demo.
azlang       0.0.3  Azure language cognitive service on the cloud.
azspeech     4.1.1  Azure Speech cognitive services on the cloud.
aztext       2.4.7  Azure Text Analytics cognitive services on the cloud.
aztranslate  2.4.6  Azure Text Translation cognitive services on the cloud.
barchart     2.0.2  Demonstrate the concept of barcharts.
beeswarm     2.0.1  Demonstrate the concept of bee swarm charts.
cars         0.0.9  Identify car make and model from a photo.
colorize     1.5.8  Demonstrate the concept of photo colorization.
cvbp         2.2.0  Computer vision best practices.
easyocr      0.0.8  Extract text from images.
facedetect   0.2.5  Simple face detection.
facematch    0.4.2  Simple face recognition.
iris         2.1.3  Classic iris plant species classifier.
movies       2.0.3  Movie recommendation using the SAR algorithm.
objects      1.6.26 Recognise objects in an image using resnet152.
ocsvm        0.0.5  Introducing one-class support vector machine.
opencv       1.0.2  OpenCV Computer Vision.
patientpaths 0.0.8  Report patient paths for specific scenarios.
ports        2.0.0  Demostrate the concept of visualising data.
pyiris       0.0.7  Classification models in Python using the iris dataset.
rain         5.1.3  Predict if it will rain tomorrow (decision tree and rand...
rbm          1.0.6  Recommendations using restricted Boltzmann machine.
sar          1.1.6  Smart adaptive recommendations.
scatter      2.0.1  Demonstrate the concept of scatter plots.
sgnc         0.1.0  Node classification for graphs using StellarGraph.
speech2txt   0.1.1  Convert audio speech to text across multiple services.
tapwater     0.0.3  Factor analysis for understanding customers
webcam       0.2.21 Capture video, process, feed dummy device for Zoom.

To install a named model, local model file or URL:

$ ml install <model>
$ █
```

Background Removal

The machine
learning hub



Object Recognition

The machine learning hub



African crocodile
American alligator
Komodo dragon



lynx
leopard
snow leopard



brambling
partridge
robin



liner
dock
planetarium



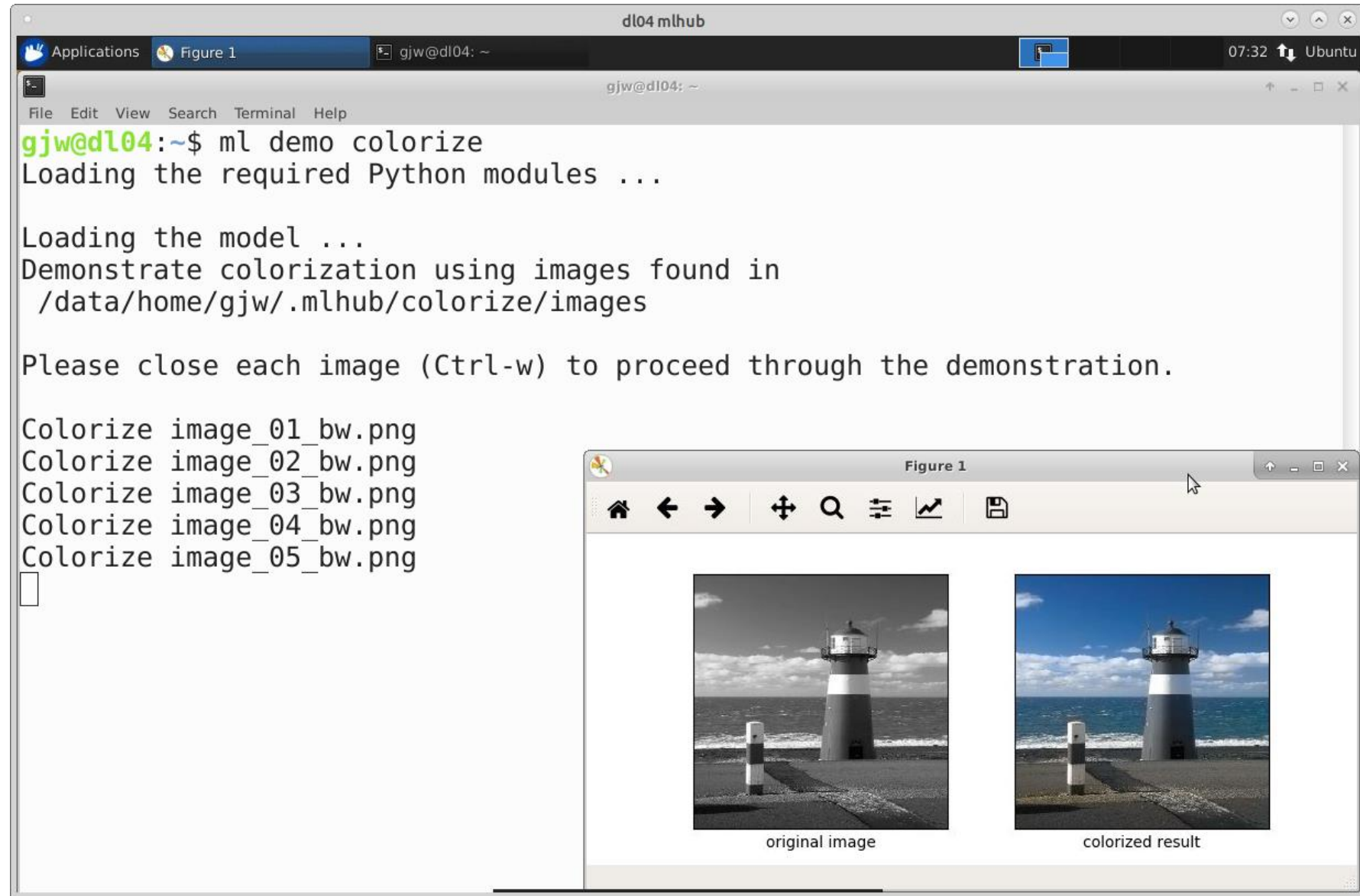
sports car
racer
convertible



indri
Madagascar cat
koala

Coloring Photos

The machine learning hub



```
gjlw@dl04: ~  
Loading the required Python modules ...  
  
Loading the model ...  
Demonstrate colorization using images found in  
/data/home/gjlw/.mlhub/colorize/images  
  
Please close each image (Ctrl-w) to proceed through the demonstration.  
  
Colorize image_01_bw.png  
Colorize image_02_bw.png  
Colorize image_03_bw.png  
Colorize image_04_bw.png  
Colorize image_05_bw.png
```

The image viewer window displays two side-by-side images of a lighthouse. The left image is labeled 'original image' and is in grayscale. The right image is labeled 'colorized result' and shows the same lighthouse with natural colors (blue sky, blue water, green grass).

Human and Artificial Intelligence

Essential Intelligence through an Open and Collaborative Society

A Near Future – Perspective

Moving from Vendor Based Data Stores (Google, Facebook, ...) to Individual's Having Agency Over Their Own Data: <https://solidproject.org/>

Thank You



Accessible AI and Machine Learning



<https://MLHub.AI>



Software Engineering driven Data Science



Industry Engagement



<https://sii.anu.edu.au>

Connections

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The Software Innovation Institute

Welcome to the Clusters – 8 February 2021



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