

Questions



Fungi Detection

Species List

- Aspergillus fumigatus
- Aspergillus niger
- Aspergillus terreus
- Aspergillus oryzae
- Aspergillus nidulans
- Aspergillus glaucus
- Aspergillus versicolor
- Aspergillus carbonarius



- Main source of foreign exchange for Sri Lanka
- Contributing major share to national economy
- World's fourth largest producer of tea
- Known for blends, such as Earl Grey, and speciality teas such as Bergamot

Ceylon Tea is a Gift to the world

[illegible]

- **Magical Place**
- Family traditions
- Improvements based on self-healing
- Empowering organic motion towards
- A better future
- Connections to the past, the future
- Learning to change

**Minuri Rajapaksha - Department of Physical Sciences,
Rajarata University of Sri Lanka**



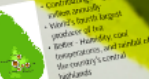
Thank You

Questions

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Fung Detection

• Detects fungal diseases from photos
• Uses deep learning to detect fungal diseases
• Detects fungal diseases from photos
• Detects fungal diseases from photos



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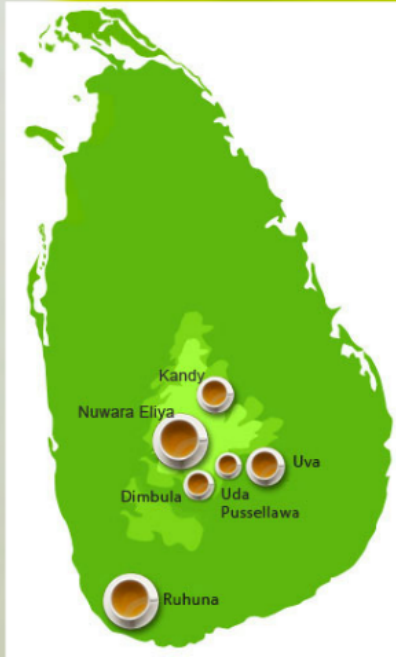
Restoring Soil Fertility with Organic Fertilizers

• Detects soil fertility from photos
• Detects soil fertility from photos
• Detects soil fertility from photos
• Detects soil fertility from photos



IoT for Productive Tea Plantation

Minuri Rajapaksha - Department of Physical Sciences,
Rajarata University of Sri Lanka



- Main source of foreign exchange for Sri Lanka
- Contributing roughly \$700 million annually
- World's fourth largest producer of tea
- Better - Humidity, cool temperatures, and rainfall of the country's central highlands

***Ceylon Tea is a Gift
to the world***

Motivation

- **Fungi Infection**
- **Impoverishment of soil fertility**
- **Decreasing organic matter contents**
- **Acidification**
- **Increases in toxic aluminum concentrations**



Fungi Detection

Fungi Detection



ance-matrix-based features were used to the detection of popcorn mold by a fungus that causes a condition called "blue-eye".

The covariance matrices - vectors that consisted of image coordinate values, their intensity values, and their Support Vector Machine use for classification purposes.

Spread fast

Absorb nutrition from plants

Now

planted them and do bio chemical testing

need labs

costly

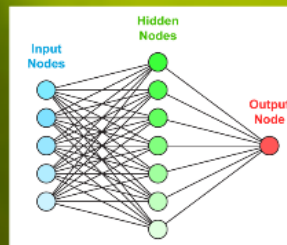
inefficient

Solution

Capture tea leave from a device

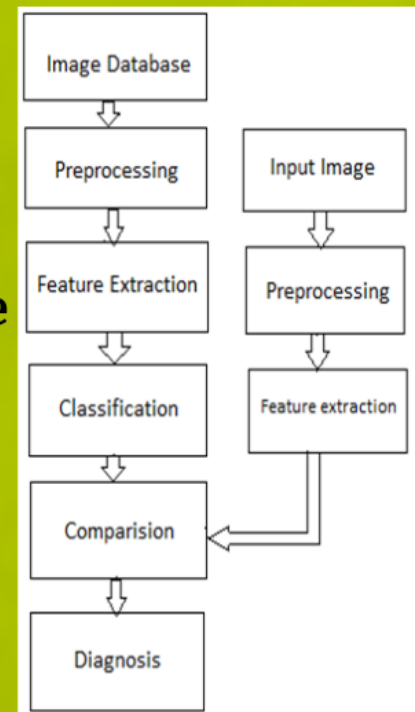
Image processing - Support Vector Machine

Artificial intelligence



Fungi Detection

Covariance-matrix-based features were applied to the detection of popcorn infected by a fungus that causes a symptom called “blue-eye”.



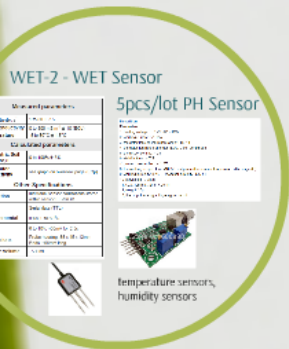
**The covariance matrices - vectors that consisted image coordinate values, their intensity values
Support Vector Machine
use for classification purposes.**

Restoring Soil Fertility with Organic Fertilizers

- Wireless Sensor Network
- Devices powered by solar power
- Physical Security : Protect from laborers
- sensor -> database -> archive -> lab

Monitor -
Soil moisture
PH
%C
%N
%K
%P
%Ca
%Mg

Solution - Treat Plants after monitoring soil moisture, fungi effects and organic fertilizer effects



WET-2 - WET Sensor

5pcs/lot PH Sensor

Measured parameters	
Permittivity, ϵ'	1 to 80 \pm 2.5
Bulk conductivity	0 to 300 mS.m ⁻¹ \pm 10 (ECb)
Temperature,	-5 to 50°C \pm 1.5°C
Calculated parameters	
Volumetric Soil Moisture, θ	0 to 100% \pm 3%
Pore water conductivity	see graph on overview page (ECp)
Other Specifications	
Calibration	Individual sensor calibrations stored within sensor EEPROM
Output	Serial data (TTL)
Environmental	IP68, 0 to 50°C
Power	6 to 10V, ~38mA for 2.5s
Dimensions	Probe housing: 55 x 45 x 12mm Rods: ~68mm long
Sample volume	~500ml

Description:

Parameters:

- 1, heating voltage: 5 \pm 0.2V (AC - DC)
- 2, working current: 5-10mA
- 3, the detection concentration range: PH0-14
- 4, the detection range of temperature: 0-80 centigrade
- 5, the response time: \leq 5S
- 6, stability time: \leq 60S
- 7, power consumption: \leq 0.5W
- 8, the working temperature: -10-50 centigrade (the nominal temperature 20 centigrade)
- 9, working humidity: 95%RH (nominal humidity 65%RH)
- 10, service life: 3 years
- 11, size: 42mm x 32mm x 20mm
- 12, weight: 25g
- 13, the output: analog voltage signal output



temperature sensors,
humidity sensors

Thank You

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Tea plantation

IoT for Productive Tea Plantation

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