VIRA KAVIR

October 2024

https://virakavir.com/en

Azam Karami

- Associate Professor, Head of Image Processing and Robotics Lab, Shahid Bahonar University, Iran (2014-Present)
- Founder, CEO, ViraKavir Company, Kerman, Iran (2018-Present)
- Postdoctoral Researcher, Department of Electrical Engineering, Purdue University, USA,2018-2021
- Postdoctoral Researcher, Vision Lab, University of Antwerp, Belgium,2014-2017
- Ph.D., Electrical Engineering-Telecommunications-Systems, Shiraz University, 2012
- Published more than 30 journal & 60 conference papers & 20 outstanding industrial projects

- Received the best project award Iran organization from Management of Electric Power Generation and Transmission (Tavanir), December 2019
- Selected as the top researcher, Ministry of Science, Research and Technology (Iran), March 2020
- Selected as the distinguished faculty member and industrial researcher, Shahid Bahonar University of Kerman, 2020 & 2021
- Patent A.Karami, ”Laser Image Measuring Object Dimensions”, G01B 00/11, 2019

Vira Kavir Team

Azam Karami
CEO
Associate Professor
PhD. Electrical Engineering
15 Years Experience
(Machine Learning,
Remote Sensing)

Mitra Peiro Hosseini
CTO
MS.c. Photonics
8 Years Experience
(Machine Learning,
Dataset Management)

Sharzad Faladat
Head of Image Processing Team
Ph.D. student Optics and Laser
10 Years Experience
(Design Optical Equipment,
Machine Learning)

Zahra Attari
Head of Aerospace
MS.c. of AI
7 Years Experience
(UAV Firmware developer,
Machine Learning)

Zahra Sargolzadeh
Business Developer
MS.c. Accounting & Finance
8 Years Experience
(Accounting,
Dataset Expert)

Vira Kavir Team

Ali Mohmmad Hossein Zadeh
CBO
Ph.D. Computer Science
20 Years Experience
(Web Developer)

Saleh Sarafraz
Head of Aerospace

MS.c. Aerospace
12 Years Experience
(UAS Design)

Ashkan Adibi
Head of Optic & Laser
Ph.D. Optics and Laser
15 Years Experience
(Design Optical Equipment, Machine Learning)

Amin Backtash
Drone Pilot
MS.c. Aerospace
6 Years Experience
(UAV Pilot)

Amin Dehghan
Drone Pilot
MS.c. Aerospace
3 Years Experience
(UAV Pilot)

https://virakavir.com/en

Vira AI-Based Smart Software for Recording and Processing Solar Power Plants Using Drone

The necessity of Vira AI-Based Solar Power Plants Software

- Solar panels, while a sustainable energy source, are susceptible to various faults that can significantly impair their efficiency and reliability. These faults can be broadly categorized into electrical, internal, and external issues, each affecting performance in distinct ways.
- Advanced techniques, such as artificial neural networks, are being developed to detect faults by monitoring voltage, current, and temperature, enhancing system reliability
- Inspection of the mentioned items is also necessary and necessary in performance of solar power plants
- Inspection with the help of drone has led to better management, more accurate identification of defects and their changes, saving time and increasing the productivity and safety of solar panels.
- Reviewing the images taken by drones by human forces is time-consuming, expensive, and accompanied by a high error rate due to the application of personal taste.
- Therefore, it is necessary to design a system for automatic detection of complications and defects, as well as checking and comparing the changes formed in them.

Vira AI-Based Solar Power Plants Software objectives

Preparing a user-friendly system for:

- Diagnosing the defects of different components of the solar panels and presenting their changes in the desired time intervals
- Identifying the solar panels defects and presenting their changes in desired time intervals
- Identifying the elements related to the solar panels, presenting their changes in the desired time intervals
- Documenting information and creating an archive and the possibility of comparing images in different visits and estimating destruction based on the passage of time
- Preparing reports from the outputs in the system in the form of videos, images, graphs, Excel tables and online and offline maps.

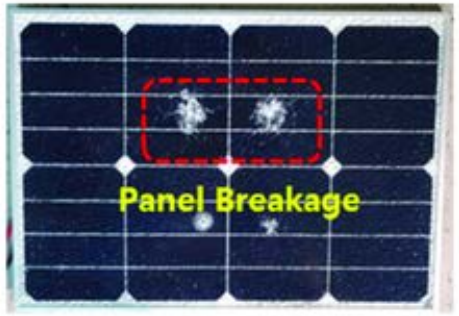
Vira AI-Based Solar Power Plants Software objectives

- Displaying the changes of the examined complications in a time series in the form of points, lines, polygons, graphs, 2D and 3D images and numerical algorithms.
- Providing a statistical view to the user and thus finding the weak points of the system
- Long-term analysis of defects to make corrections and increase stability
- Reducing the need for manpower
- Solving the problems caused by periodic visits by people and increasing life and financial security, accuracy, speed and reducing inspection costs.

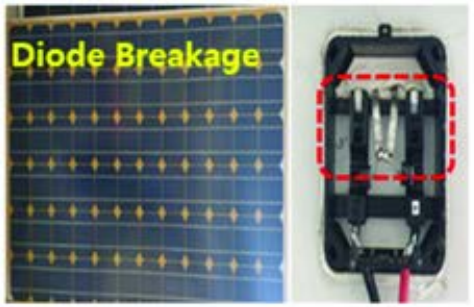
Defects of different components of the solar power plants

- Defects of Electrical Faults: Common issues include short circuits and open circuits, which can lead to substantial power losses.
- Defects of Internal Faults: These occur at the cellular level, such as bridging or bypass diode faults, which can disrupt energy conversion
- Defects of External Faults: Environmental factors like shading, snow, or physical damage (e.g., glass breakage) can also hinder performance

Defects of different components of the Solar Panels

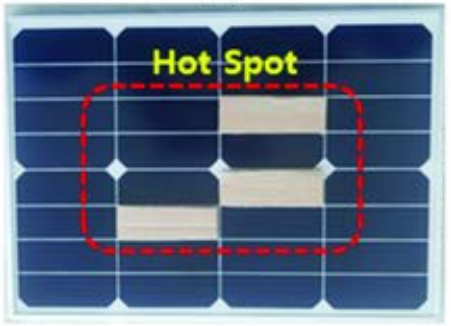


(a)



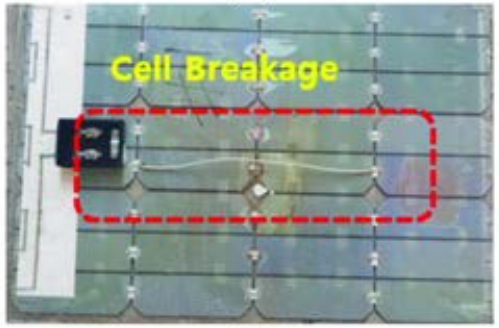
(b)

(c)



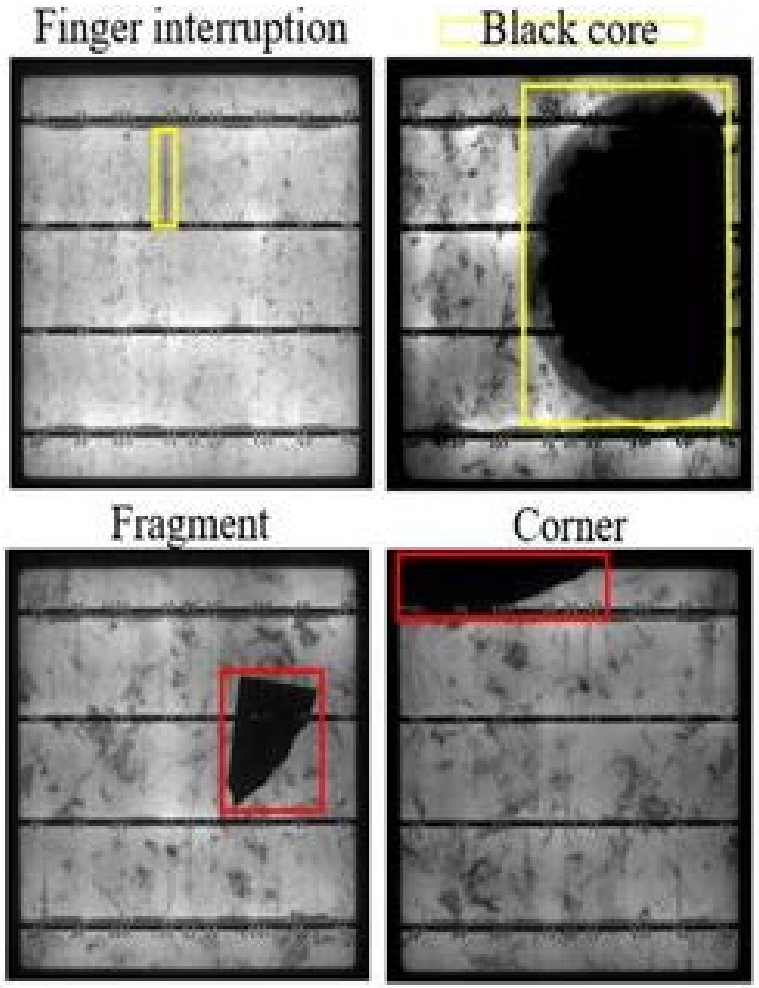
(d)

(e)



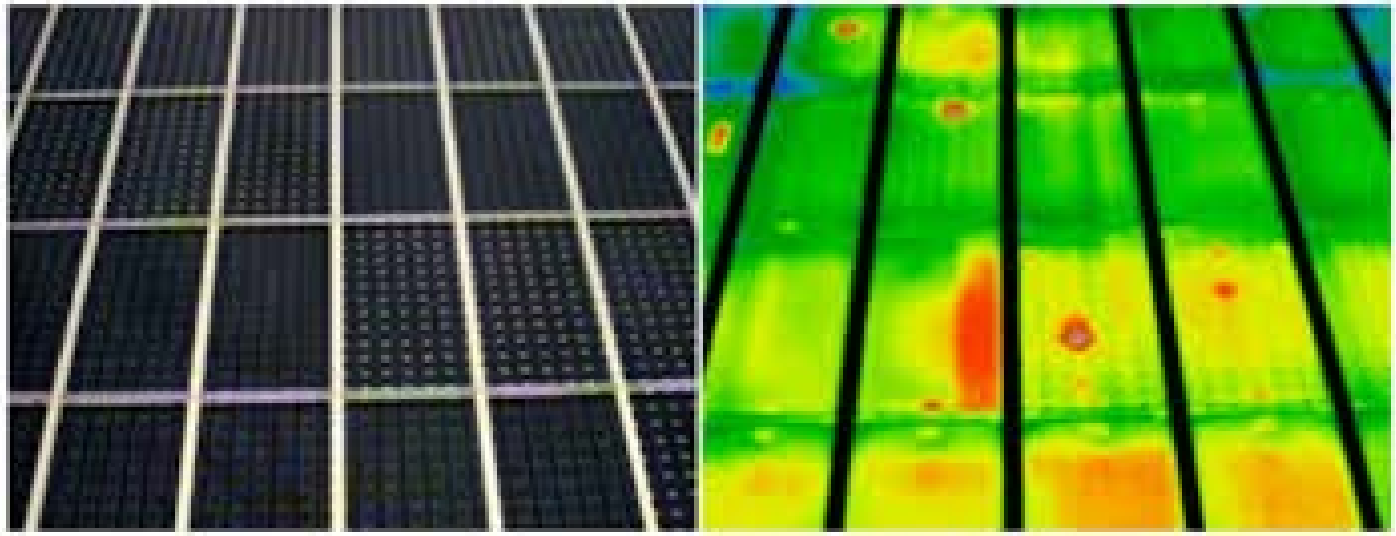
(f)

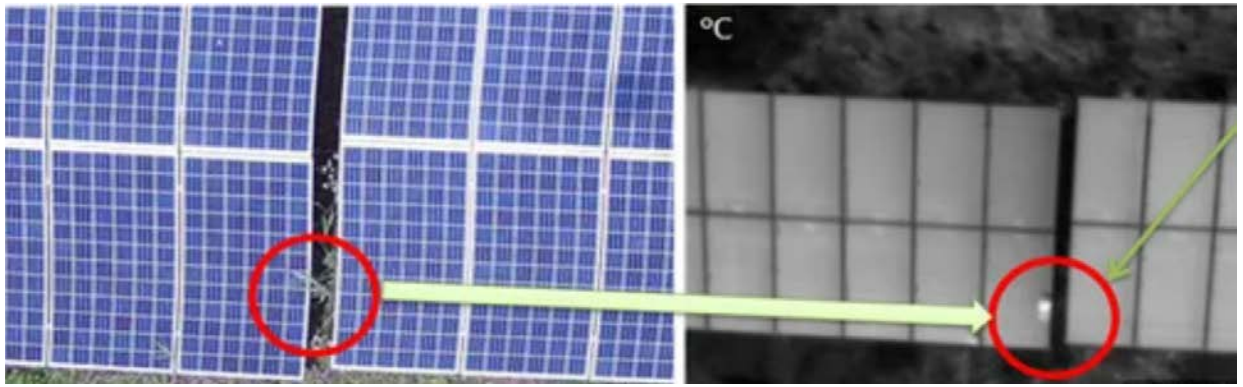
Defects of different components of the Solar Panels



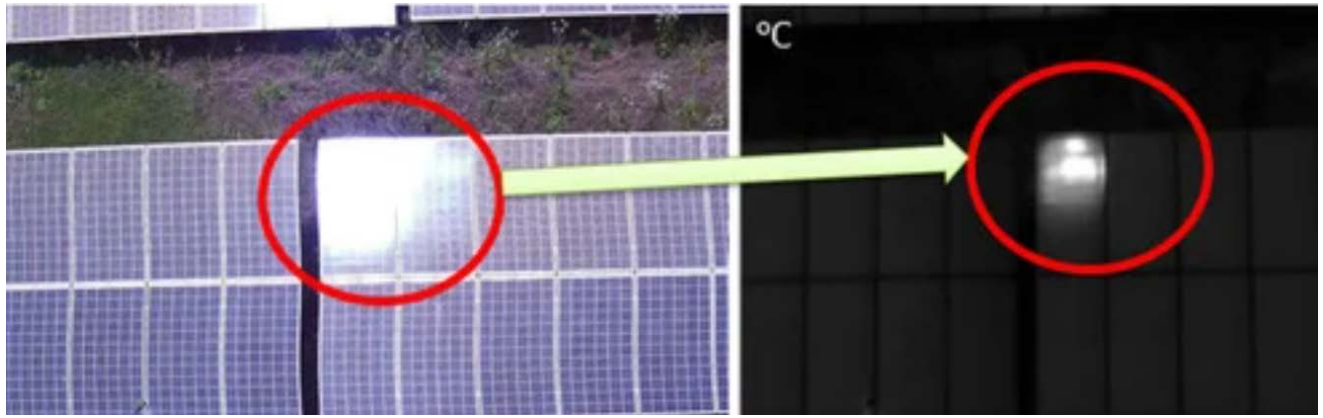
Defects of different components of the Solar Panels

Hotspots

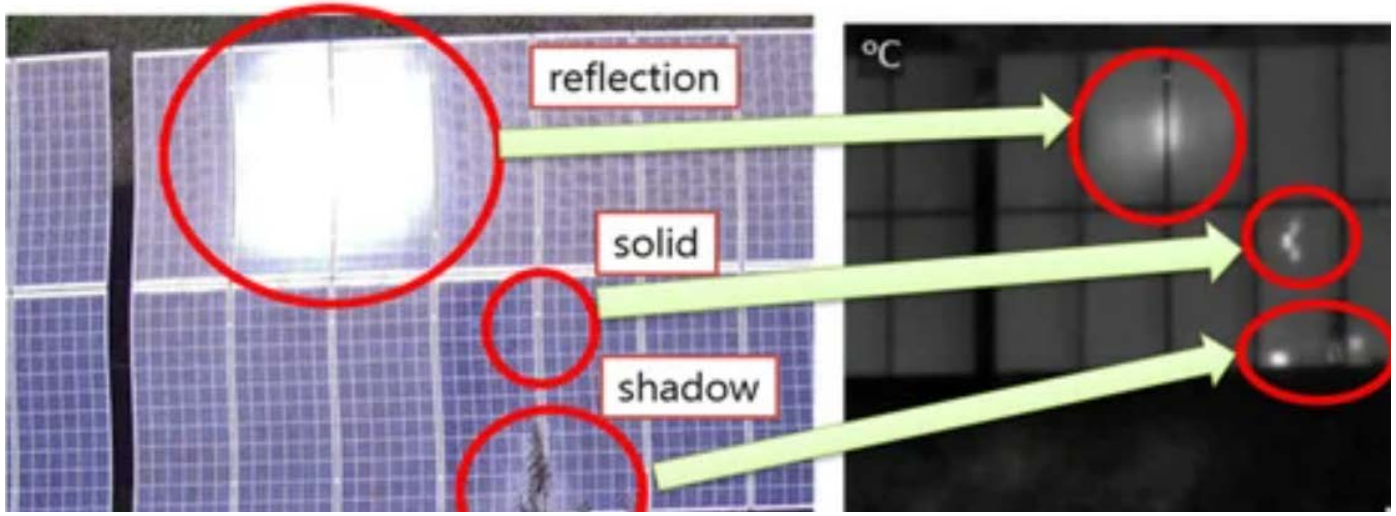




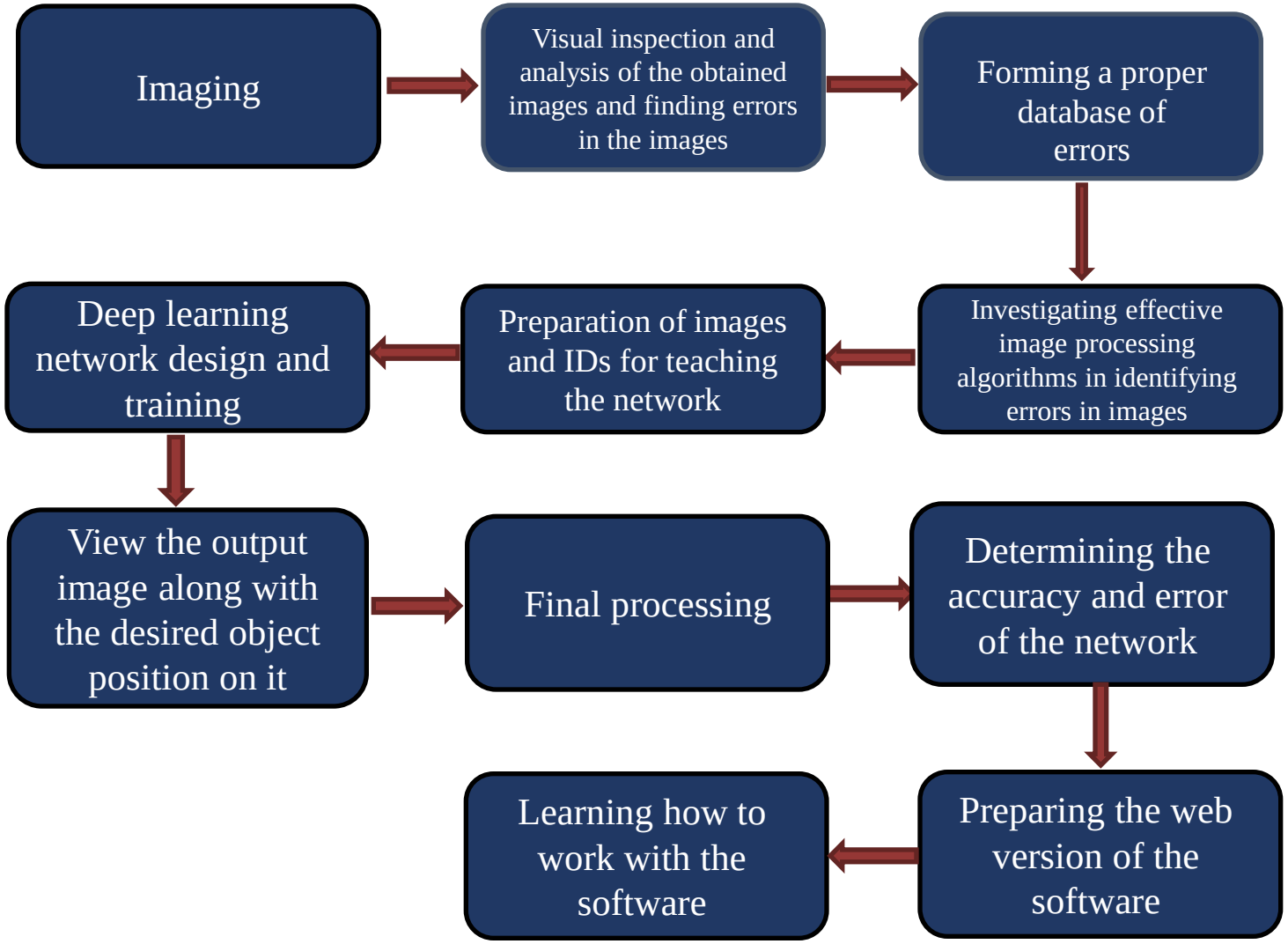
Error caused by sunlight reflection



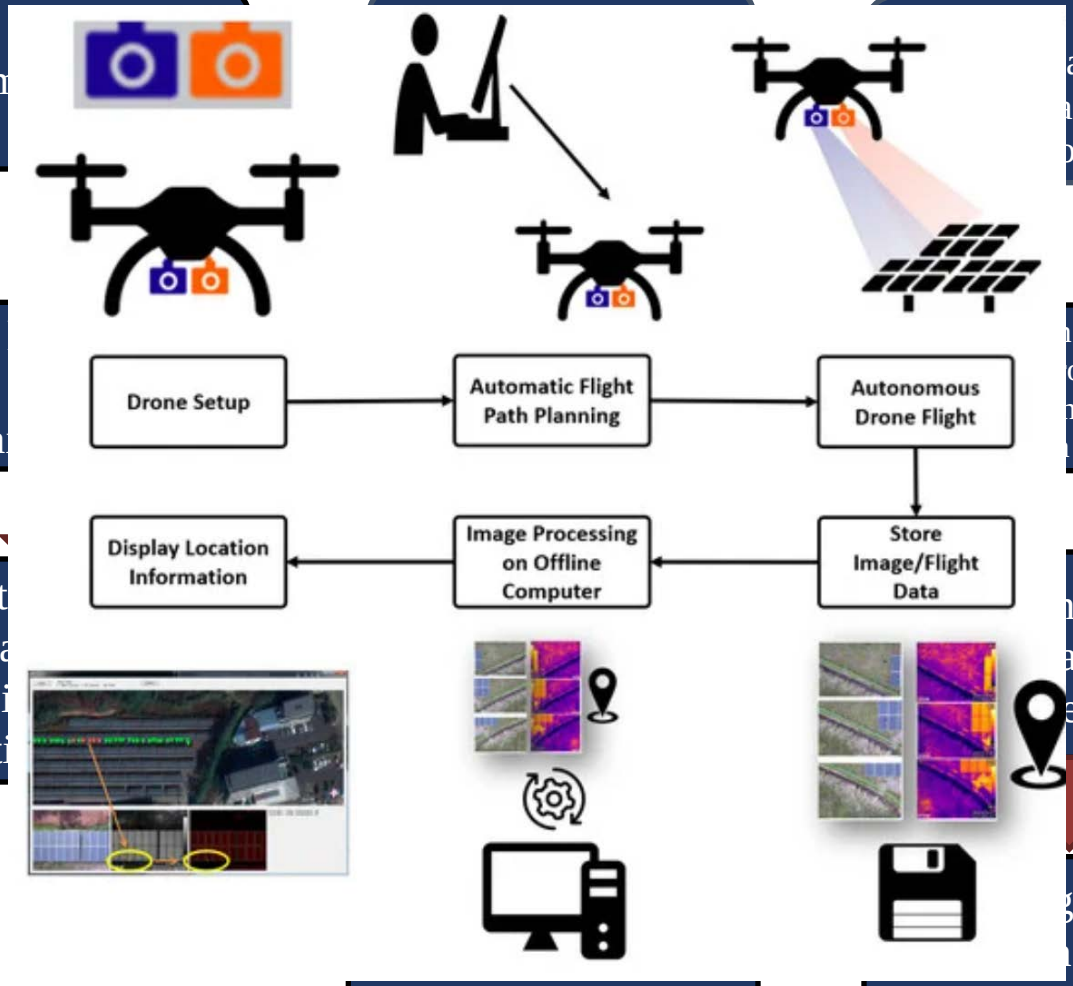
Hot spots caused reflection due to sunlight, solid on PV surface, and shadows.



The Methodology of Vira AI-Based Solar Power Plants Software objectives



The Methodology of Vira AI-Based Solar Power Plants Software objectives



Thanks for Your attention

Thank You

Please contact us for more information

a.karami@virakavir.com , azam.karami@gmail.com
+98 913 398 7567

https://virakavir.com/en