2025 Video and Image Processing Cup

Infrared-Visual Fusion for Enhanced Drone Detection, Tracking and Payload Identification in Surveillance Videos

Official Document of the 2025 Video and Image Processing Cup

Version 1.1 *Last updated 31 March 2025*

1. Introduction

Unmanned Aerial Vehicles (UAVs), commonly referred to as drones, have gained significant prominence in recent years due to their diverse applications in areas such as surveillance, delivery, agriculture, logistics, disaster response, and military operations. However, the proliferation of drones has also introduced critical challenges such as unauthorized aerial activity, potential threats from payload delivery systems including payload delivery for malicious purposes as well as major security and privacy concerns. This necessitates the detection and tracking of drones, along with the identification of their payloads to ensure safety and security, particularly in sensitive or restricted areas.

Traditional vision-based approaches for drone detection predominantly rely on RGB images, which are often hindered by environmental factors such as low light, fog, or glare. On the other hand, infrared (IR) imaging provides complementary information by capturing thermal signatures enabling robust detection in challenging conditions such as nighttime or occlusion even in cases where the drones are exceedingly far from the field of view (FoV) of the surveillance cameras. Although it may seem that infrared imaging outperforms RGB imaging in such cases, standalone use of IR data may lack the spatial and textural richness provided by RGB images. This makes it essential to combine the two modalities to leverage their complementary strengths.

Alongside drone detection, the ability to detect and identify payloads carried by drones is critical due to the potential risks associated with unauthorized or malicious payload delivery. Payloads may include hazardous materials, surveillance equipment, or contraband, posing threats to public safety, security, and privacy. Identifying payloads in real-time enables proactive measures to mitigate risks making it an essential aspect of drone monitoring systems. However, identifying and analyzing payloads carried by drones poses unique challenges. Payloads may vary in size, shape and thermal properties making it difficult to rely on a single modality for robust detection. RGB imaging provides critical visual cues for recognizing payload shapes and textures while IR imaging can highlight heat signatures of payloads, particularly those carrying heat-generating devices or components. A fusion-based approach is therefore crucial to enhance payload detection accuracy and reliability.

2. Competition Details

2.1 Task Description

The datasets, for both payload identification and drone detection, would be made available to the registered participants. The proposed solutions must be able to detect and track drones and identify the payload in real-time for each scenario considered in the datasets. A detailed description of the datasets along with a summary of each scenario considered will be provided with the datasets. Annotations for the training set will be made available along with the release of the datasets. The participants are also required to submit readable code of the proposed algorithm (preferably Python) with appropriate documentation and a brief description of the steps followed. Each solution should contain a demo code that could be used to run the submitted solution for a test video. The classification accuracy for the drone must be displayed in real-time on the test video while it is being played. The classification accuracy for the identified payload can be reported at the end of inference. The participants are also required to share the inference time (an evaluation metric) of their code and system specifications on which it was implemented. The proposed solution must meet the following criteria:

● The provided dataset of RGB and IR images must be used to train 3 different models - One on each RGB & IR, and one on the dataset obtained from fusion of these image pairs

The following rules apply for each of the above-mentioned models:

● The model must be able to identify drones and differentiate them from other flying entities in real-time under different scenarios considered in the dataset.

● The proposed solution should be able to track the trajectory of drones under various topographical conditions including distortions considered in the dataset and must be able to make conclusions on whether the drones are approaching or receding from the FoV of the camera source.

● The model must be able to identify the type of payload along with the drone and report the same during the inference. A brief description of different payloads will be made available along with the release of the dataset.

Fig. 1. RGB Image of a drone

Fig. 2. IR Image of a drone

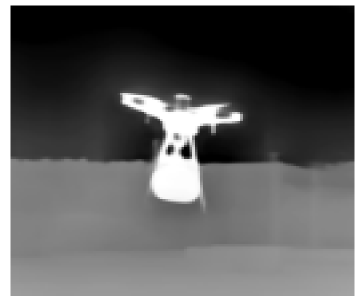

Fig. 3. IR image payload carrying drone

2.2 Dataset Description

Drone Detection and Tracking Dataset:

Parameter Considered	Description
Type(s)	IR/Thermal, RGB/Visual
Modality of the dataset	Images and Videos
Number of classes	2 (Drone and Bird)
Number of images and videos in the train set	45000 IR-RGB image pairs
Number of images and videos in the validation set	6500 IR and RGB images + 40 video sequences
Number of images and videos in the test set	13000 IR and RGB images + 25 video sequences
Frame rate of videos in the dataset	30 fps
Resolution of each video	320 x 256 pixels

Image size	320 x 256
Duration of each video	10 s
Environmental factors considered	Hilly regions, thick forest cover, cloudy sky, fog and mist
Scenarios	Single class in a frame, multiple classes in a frame, objects far off from the FoV of the source camera, swarm of birds and drones, drones captured under extreme environmental conditions as stated above
Distortions considered	Speckle noise, salt and pepper noise, Gaussian blur, uneven illumination, motion bur, camera instability and AWGN
Number of videos with distortions	30
Intensity of distortions (on a scale of 5)	Speckle noise – 2 Salt and Pepper noise – 2 Gaussian blur – 4 Uneven illumination – 4 Motion blur – 4 Camera instability – 5 AWGN - 3

Payload Identification Dataset:

Parameter Considered	Description
Type(s)	IR/Thermal, RGB/Visual
Modality of the dataset	Images
Number of classes	2 (Harmful payload and Normal payload)
Number of images in the train set	25000 IR-RGB image pairs

Number of images in the validation set	4000 IR and RGB images
Number of images in the test set	8000 IR and RGB images
Image size	320 x 256
Environmental factors considered	Hilly regions, thick forest cover, cloudy sky, fog and mist
Scenarios	Single class in a frame, multiple classes in a frame, objects far off from the FoV of the source camera, swarm of birds and drones, drones captured under extreme environmental conditions as stated above
Distortions considered	Speckle noise, salt and pepper noise, Gaussian blur, uneven illumination, motion bur, camera instability and AWGN
Intensity of distortions (on a scale of 5)	Speckle noise – 2 Salt and Pepper noise – 2 Gaussian blur – 4 Uneven illumination – 4 Motion blur – 4 Camera instability – 5 AWGN - 3

2.4 Evaluation Protocols

2.4.a. Task1: RGB + IR Drone Detection

The evaluation of drone detection will focus on the performance of the individual modalities (IR & RGB) and the fusion model that integrates both RGB and infrared modalities. The goal is to ensure that the detection system accurately distinguishes drones from other aerial entities (e.g., birds) even under challenging environmental conditions and distortions. Key evaluation components include:

- **Classification Metrics:**
    - **Accuracy, F1 Score, Precision, and Recall:** The system's ability to correctly detect drones will be assessed using these standard metrics.
- **Robustness Under Adverse Conditions:**
    - The model will be tested on scenarios that include low light, fog, uneven illumination, and other distortions (e.g., Gaussian blur, motion blur, AWGN).
    - Special attention will be given to cases where the drones are extremely far from the camera's field of view or partially obscured
- **Real-time Performance:**

  - The confidence score of detection will be displayed in real-time on test videos, ensuring that the system can operate within the constraints of real-world surveillance.
  - Inference speed (frames per second on both CPU and GPU) and overall inference time will be measured to ensure timely detection.
- **Evaluation:**
  - The evaluation will include a comparison of results from the fusion model against models trained solely on RGB or IR images, highlighting the benefits of multimodal fusion.

2.4.b. Task 2: RGB + IR Drone Tracking

For drone tracking, the focus is on the system's ability to follow the drone's trajectory across video frames and determine its relative motion. The evaluation protocol includes:

- **Trajectory Accuracy and Continuity:**
  - **Tracking Consistency:** The system must maintain continuous tracking, with a strict limit on missed frames (fewer than 15 consecutive frames without a track).
    Spatial Accuracy: Quantitative metrics such as frame-by-frame IoU between predicted and ground truth bounding boxes will be used to assess the precision of the tracking.
- **Directional Analysis:**
  - The model must determine whether a drone is approaching or receding from the camera's field of view, with the corresponding decision reported in real-time.
- **Robustness in Challenging Conditions:**
  - The tracking algorithm will be evaluated under various environmental scenarios, including topographical distortions (e.g., hilly regions, thick forest cover) and adverse weather conditions.
  - The effect of typical distortions (such as motion blur and camera instability) on the track continuity and accuracy will be specifically measured.
- **Real-time Operational Metrics:**
  - Similar to detection, the tracking performance will be assessed on its inference speed (fps) and overall latency.
  - Video sequences from the test dataset will be used as benchmarks to ensure that the algorithm performs robustly under practical surveillance conditions.

2.4.c. Task 3: Payload Detection

Payload detection focuses on accurately classifying the type of payload carried by a drone—distinguishing between harmful and normal payloads. The evaluation protocol for payload detection includes:

- **Classification Performance:**
  - **Accuracy, F1 Score, Precision, and Recall:** These metrics will assess the system's ability to correctly identify payload classes from the fusion of RGB and IR imagery.
  - **Mean Average Precision (mAP):** This metric will help quantify the detection quality, especially in scenarios with multiple payload instances.
- **Evaluation on Dedicated Dataset:**
  - The payload detection will be tested using a separate dataset specifically annotated for payload classes.
  - The dataset will include challenging conditions such as low lighting, occlusion, and environmental distortions to verify the robustness of the detection algorithm.
- **Fusion Benefits:**
  - The evaluation will demonstrate how combining thermal signatures from IR imaging with the spatial and textural details from RGB imaging enhances payload identification, particularly when payloads are subtle or have low contrast.

- **Real-time Reporting:**
  - While the drone detection confidence score is displayed in real-time, the confidence of payload detection will also be reported at the end of the inference process.
  - Inference time and system specifications will also be assessed as part of the overall performance evaluation.

2.5 Data organization

The data is organized as follows:

Main Directory	Sub Directory	Dataset Split	Type	Contents
Data/	RGB/	Train/	Folder	Images/ , Labels/
		Validation/	Folder	Images/ , Labels/
		Test/	Folder	Images/ , Labels/
	IR/	Train/	Folder	Images/ , Labels/
		Validation/	Folder	Images/ , Labels/
		Test/	Folder	Images/ , Labels/
	Payload/	Train/	Folder	Images/ , Labels/
		Validation/	Folder	Images/ , Labels/
		Test/	Folder	Images/ , Labels/
	Dataset_Statistics.txt	-	File	Describes dataset statistics
	Challenge_Description.txt	-	File	Describes the challenge

3. Evaluation Metrics

Task 1: RGB + IR Drone Detection

Final Composite Score Formula:

- $S\_det = ((A + F_1 + P + R) / 4) \times R\_b \times S\_d$

Where:

- • A = Accuracy (Normalized as a decimal, e.g., 92% → 0.92)
- • F_1 = F1 Score (Normalized similarly to Accuracy)
- • P = Precision (Normalized as a decimal)
- • R = Recall (Normalized as a decimal)
- • R_b = Normalized Robustness Score

- Calculated as the average ratio of the performance metric (F1 Score) achieved under each adverse condition to a benchmark maximum for that condition.

- Example: $R_b = (1/N) * \Sigma (F1_i / F1_{max\_i})$, for N adverse conditions.

· • S_d = Normalized Inference Speed

- Calculated as the ratio of the model's achieved FPS to a target FPS (e.g., 30 FPS), capped at 1.

- Formula: $S_d = \min(1, FPS_{model} / FPS_{target})$.

Detailed Description:

For Task 1, the detection system is evaluated on its ability to distinguish drones from other aerial objects under various conditions. Metrics such as accuracy, F1 score, precision, and recall are first normalized to a [0, 1] scale. These metrics are averaged, providing a baseline classification score. This baseline score is then multiplied by the robustness score (R_b), which accounts for performance under adverse conditions like low light, fog, and motion blur. Finally, the product is adjusted by the normalized inference speed (S_d), ensuring that real-time operation is rewarded.

Task 2: RGB + IR Drone Tracking

Final Composite Score Formula:

· $S_{track} = ((I + C + D) / 3) \times S_t$

Where:

· • I = Average Intersection-over-Union (IoU) between predicted and ground truth trajectories
· • C = Tracking Consistency factor

– $C = 1 - (M / 15)$, where M is the number of consecutive missed frames (for $M < 15$; if $M \geq 15$, $C = 0$)

· • D = Directional Accuracy

- Indicates the accuracy in determining whether the drone is approaching or receding from the camera's field of view.

· • S_t = Normalized Inference Speed for Tracking

- Computed similarly to S_d, using the FPS achieved during tracking relative to a target FPS.

Detailed Description:

In Task 2, the focus is on tracking the drone's movement and trajectory accuracy. The average IoU (I) measures how well the predicted trajectory aligns with the ground truth. A consistency factor (C) is defined to penalize long sequences of missed detections, ensuring continuous tracking is maintained. Directional Accuracy (D) ensures that the system correctly identifies whether a drone is moving toward or away from the camera. These three metrics are averaged and then scaled by the normalized tracking inference speed (S_t), ensuring that the tracking system operates within real-time constraints.

Task 3: Payload Detection

Final Composite Score Formula:

- S_payload = (C_score + mAP) / 2

Where:

- • C_score = (A + F_1 + P + R) / 4

- A, F_1, P, and R are the standard classification metrics for detecting payload types, each normalized to [0, 1].

- • mAP = Mean Average Precision

- Assesses the overall detection quality, especially in scenarios with multiple payload instances, normalized to [0, 1].

Detailed Description:

Task 3 evaluates the system's ability to classify the type of payload carried by a drone. The classification performance is first quantified by averaging the normalized values of accuracy, F1 score, precision, and recall, resulting in C_score. This is then averaged with the normalized Mean Average Precision (mAP), which captures the detection quality, to produce the final payload detection score. This balanced approach ensures that both classification accuracy and detection precision contribute equally to the evaluation.

Overall Team Ranking

Final Overall Ranking Formula:

- S_overall = w_1 * S_det + w_2 * S_track + w_3 * S_payload
- For equal weighting ($w_1 = w_2 = w_3 = 1/3$):
- S_overall = (S_det + S_track + S_payload) / 3

Detailed Description:

The overall team ranking is computed by aggregating the scores from the three tasks. Weights (w_1, w_2, w_3) can be assigned to emphasize one task over another; however, equal importance is assigned to each task, hence each weight is set to 1/3. Teams are then ranked in descending order of S_overall. This composite score ensures that performance across detection, tracking, and payload identification is fairly integrated, reflecting both the accuracy and efficiency of the system.

4. Participants submissions

4.1 Results

Submission Guidelines:
Each participating team must submit their complete solution in a zipped file via the challenge webpage. The submission must adhere to the following specifications:

- **File Naming Format:**
  Name your zipped file as: TeamName_IR_RGB_Drone_ICIP2025

- **Contents of the Zipped File:**
  Your zipped file must include the following items:
  1. **Main Code -** containing the complete implementation details with comments.
  2. **Demo Code:** a separate or integrated demo code that can be executed on a test video to evaluate the submitted solution.

Note: Incomplete submissions that do not include scores/results for all trials or required components will be disqualified.

4.2 Technical Report

Each team must include a short technical report in their zipped submission. This report should provide a clear summary of your approach and must cover the following areas:

- **System Architecture:**
  - Describe your fusion-based approach that integrates RGB and infrared (IR) data for enhanced drone detection, tracking, and payload identification.
  - Explain the data preprocessing steps, sensor fusion techniques, and overall algorithmic pipeline.
- **Algorithmic Implementation:**
  - Provide a detailed explanation of the algorithms used for:
    - Detecting drones and differentiating them from birds in images/videos.
    - Tracking drones, including methods for computing the trajectory and determining whether a drone is approaching or receding from the camera's FoV.
    - Detecting the type of distortions (e.g., low lighting, fog, motion blur) and handling these challenges.
  - Justify your design choices and any optimization techniques employed.
- **Demo Code Description:**
  - Explain how the demo code functions, highlighting how detection confidence scores, distortion types, bounding box outputs, and drone trajectories are visualized.
    Describe how the demo code facilitates real-time evaluation of your solution.
- **Performance Metrics:**
  - Summarize the performance of your system using the evaluation metrics defined in Section 3 (e.g., accuracy, IoU, mAP, inference speed).
- **System Specifications:**
  - Detail the hardware and software environment used, including inference times on both CPU and GPU.

Submission Deadline:
Ensure that your complete submission (zipped file with all required items) is received by the final submission deadline.

5. SPS Competition Terms & Conditions

5.1 Team Eligibility

Full details of team eligibility are available in the Terms and Conditions document available on the SPS website.

5.1.a. Team Composition

- Each team <u>MUST</u> be composed of: (i) One faculty member (the Supervisor) and (ii) At least 3 but no more than 10 undergraduates; *Optionally* (iii) At most one graduate student (the Tutor).
  - At least three of the undergraduate team members must be SPS student members at time of team registration, and maintain this status until the end of the competition

- Further definitions of each team position are as follows:
    - Faculty (Supervisor): Postdocs and research associates are not considered as faculty members.
    - Graduate Student (Tutor): A graduate student is a student having earned at least a 4-year University degree at the time of submission. *Please note: Tutors are not eligible to receive travel grants or prize money.*
    - Undergraduate: An undergraduate student is a student without a 4-year degree.

- Team members cannot be changed after the team registration deadline.
- At least one undergraduate team member must be in attendance (in-person) of the final round of the competition held at the respective conference (ICASSP or ICIP) to present the team's work.*****

***Important notice:** Upon registering a team for the competition, the team must commit to at least one undergraduate team member representing the team by attending the physical competition and participating in the final round of the competition at the physical conference. <u>Should a team not be able to participate physically (in-person) in the final round of the competition held at the respective conference (ICASSP or ICIP) for any reason, at any point in the competition, then the team must notify SPS Staff and organizers immediately</u>. This will result in the team being ineligible to continue in the competition, therefore forfeiting their position in the competition. Teams must make every effort to attend the final round at the conference; visa issues *may* be an exception. *If all team members are unable to obtain visas, please be prepared to present proof of visa process, communication to obtain visa, as well as a visa denial. All eligibility decisions are at the discretion of the SPS Student Services Committee and competition organizers*.

Should a team be disqualified or forfeit their finalist position for any reason, the next team selected by the organizers may be contacted to compete in the final round, following the same guidelines as above.

5.1.b Team ineligibility (Further clarification)

Specific team **<u>ineligibility</u>** in addition to the above. *Any of these criteria will result in the team being disqualified/ineligible to continue in the competition:*

- Teams that are composed with 50% or more of its undergraduate or tutor members being students who have previously participated on a finalist team within the last year are not eligible. *For example, if two of four undergraduate team members participated as a member of a finalist team during the 2023 SP Cup will not be eligible to participate on a team for the 2023 VIP Cup.*
- Any team members who have placed in the top three teams of any SPS competition held during the previous conference, i.e. a member from one of the 3 finalist teams of the 2023 SP Cup (at ICASSP) will not be eligible to participate in the 2023 VIP Cup (at ICIP). Any team member that has received SPS travel support within the previous year would not be eligible to receive travel support again if their team is selected as a finalist.
- Team members cannot simultaneously participate in more than one competition at the same time. Team members cannot participate on more than one team at the same time.

5.2 Final Round Judging Criteria for SPS Competitions

The judging for the final phase of the competition held live at the conference will be based on five equally weighted criteria unless otherwise specified by the competition organizers in the Call for Participation. Each of the three finalist teams will be scored on the five criteria and the team with the highest score will place 1st, the team with the second highest score will place 2nd, and the team with the third highest score will place 3rd in the competition.

The five equally weighted criteria are:

1. Innovation of the proposed approach
2. Performance of the first stage competition (by choosing the best submission, score as indicated on the website)
3. Performance of the last submission (second phase held live at the conference) separately on the dataset(s)
4. Quality and clarity of the final report
5. Quality and clarity of the presentation

Each criterion is scored with a 1, 2, or 3; the best team in each criterion will receive 3 points, the second best team will receive 2 points, and the third best team will receive 1 point. The final winning rankings will be based on the highest points awarded from the five criteria during judge deliberations at the end of the competition. Final rankings are ultimately decided by the judges, at their discretion.

5.3 Judge Participation & Conflict of Interest Final Round Judging Criteria for SPS Competitions

Any judge or team supervisor participating in the competition must sign a Conflict-of-Interest Form agreeing to the following key points. Full information is on the Conflict-of-Interest Form.

Conflict of Interest concerns shall be disclosed and addressed in accordance with IEEE Policies 9.9 A, B. and C and IEEE Policy 4.4.H. - Eligibility and Process Limitations. Judges involved at any stage of the team rankings/scoring process for an SP competition shall be ineligible to judge/vote on the outcome of team rankings for the competition in which the conflict exists. Any real and perceived conflict of interest shall be avoided. Conflict of interest shall be defined as any relationships, professional or otherwise, that can affect impartiality and objectivity. Such relationships include, but are not limited to the below list. This list also applies

a. faculty supervisor/student,
b. faculty supervisor/post-doc,
c. manager/employee,
d. shared institutional affiliations,
e. recent (less than five years) research collaborations or joint authorship,
f. judge/team supervisor
g. In the case of a conflict of interest, the judge should neither listen to nor speak in the discussion and should not vote on the team scoring/ranking process.

In our SPS Policies and Procedures (https://signalprocessingsociety.org/volunteers/policy-and-procedures-manual)

The IEEE Conflict of Interest form must be completed before participating in the competition. The Conflict of Interest form can be completed at the following link: https://www.ieee.org/about/compliance/conflict-of-interest/coiandpob.html

Conflict Resolution Process

The Society leadership will create an ad hoc committee to handle each matter requiring conflict resolution.

1. **Composition.** The composition of each ad hoc committee will include area experts. The experts should be chosen based on mediation experience or subject area experience. All members of the ad hoc committee should be non-conflicted, e.g., no prior involvement in the situation, no collegial work relationship, etc. The committee may be augmented with the agreement of all members of the ad hoc committee. The committee will select its own chair.

2. **Process.** During the first meeting of the ad hoc committee, the committee shall create a timeline detailing the conflict resolution process, as well as determine any operational rules for the ad hoc committee's operation (e.g., length of final report; length of statement of dissent, etc.) The individual who brought the conflict matter forward shall be informed of the timeline. All discussions and information presented to the ad hoc committee shall be handled in a confidential manner.

Decisions need not be unanimous; final outcomes may be determined by majority vote of the membership of the ad hoc committee. Dissenting members may include their dissenting opinion as part of the report; the length of such dissent will be determined as part of the committee's operational rules.

After the ad hoc committee has determined its final ruling, the ad hoc committee chair shall be responsible for preparing a short report documenting the committee's findings. The report shall be provided to the individual who brought the conflict matter forward.

3. **Appeal.** If the individual who brought the conflict matter forward feels that the matter has not been adequately resolved by the ad hoc committee at the Society level, the individual may escalate the matter further to TAB or IEEE. The ad hoc committee report shall be shared with TAB and/or IEEE.

5.4 Prizes for Finalists

The [eligible] three teams with the highest performance in the open competition based on the judging criteria will be selected as finalists and invited to participate in the final competition at ICASSP or ICIP. The champion team will receive a Grand Prize of $5,000. The first and the second runner-up teams will receive a prize of $2,500 and $1,500, respectively, in addition to travel grants and complimentary conference registrations for up to three team members.

- Up to three undergraduate student members from each finalist team will be provided travel support to attend the conference in-person. In-person attendance of the physical conference is required for reimbursement.
  - Travel grant funds are offered on a reimbursement basis of up to $1,200 for continental travel and $1,700 for intercontinental travel. There are no exceptions.
  - Funds will be issued by way of a bank transfer after the competition via Concur.
  - Receipts for reimbursement must be uploaded into Concur
    - Prior to claiming your travel grant award, you must submit receipts of your travel expenses that are equal to or exceed the grant amount in order to receive the full travel grant payment. Travel expenses include: air fare, train tickets, hotel, visa fees, transit, and meals. Receipts are required for all items and must equal to or exceed the total reimbursement amount. **The receipts must show** form of payment used, name, date, and amount paid. Hotel reservation confirmations or bookings, invoices, or quotes for airfare are not acceptable receipts unless the proof of payment is also provided with the document.
    - All travel expenses should be submitted through IEEE's NextGen Expense Reimbursement (Concur) tool. Detailed instructions will be shared with the (up to) 3 undergraduate members receiving travel support as part of one of the finalist teams.
  - Any team member that has previously participated in a finalist team and received SPS funded travel support within the last calendar year are not eligible to receive the support again if their team is selected as a finalist.
- Complimentary conference registration for up to three undergraduate team members.
  - These complimentary conference registrations cannot be used to cover any papers accepted by the conference.
  - You must notify Jaqueline Rash, Jaqueline.rash@ieee.org, via email of the three team members who have been chosen to receive complimentary registration.
  - **VISA information:** Once registered for the conference, each individual will have the opportunity to request an invitation letter through the conference website to be used for the visa application process. This is the only way to receive a letter for visa purposes.
- The finalist teams will also be invited to join the Conference Banquet and the SPS Student Job Fair, so that they can

meet and talk to SPS leaders and global experts. Please note registration for the Conference Banquet and Student Job Fair is limited and based on availability. You must add this event to your registration. If you are unable to add these events, then maximum capacity has been reached. *There may be additional availability for the Student Job Fair, but not the Conference Banquet. You can inquire by emailing Jaqueline.Rash@ieee.org.*

6. Important Dates

- Challenge announcement 30 March 2025
- Availability of Training Data – 10th April 2025
- Team Registration Deadline: 30 April 2025 (Register herev)
- Availability of Test Data – 20th May 2025
- Final submission due: 15 June 2025
- Finalists announcement: 15 July 2025
- Presentation by top 3 teams and announcement of winners at ICIP 2025: September 14-17, 2025

7. Registration and Important Resources

7.1 Official SP Cup Team Registration

All teams must be registered through the official competition registration system in order to be considered as a participating team. Official team registration must be submitted via:
https://www2.securecms.com/VIPCup/VIPRegistration.asp

All teams MUST acknowledge and agree to the 'SP and VIP Cup Terms & Conditions' to be eligible for the competition.

7.2 Resource Links

- SP and VIP Cup Terms & Conditions: Located on both SP Cup and VIP Cup pages of SPS website
- Conflict of Interest: SPS Policies and Procedures
- IEEE Conflict of Interest form: **https://www.ieee.org/about/compliance/conflict-of-interest/coiandpob.html**
- 2025 VIP Cup Information Page
- **Official team registration and submission system:** https://www2.securecms.com/VIPCup/VIPRegistration.asp

8. Contacts

Competition Organizers (technical, competition-specific inquiries):

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SPS Staff (Terms & Conditions, Travel Grants, Prizes):
Jaqueline Rash, SPS Membership Program and Events Manager
Email: Jaqueline.Rash@ieee.org

SPS Student Services Committee
Lucas Thomaz, Chair
Email: lucas.thomaz@smt.ufrj.br

9. Competition Organizers

Competition Organizers:
[SPS Technical Committee endorsing competition]
Vishnu Ravishankar, Software Development Engineer, ARTPARK, Indian Institute of Science, India
Dharini Raghavan, Graduate Student, Georgia Institute of Technology, Atlanta, USA
Dr S Sethu Selvi, Professor, Department of ECE, Ramaiah Institute of Technology, India
Dr Raghuram S, Associate Professor, Department of ECE, Ramaiah Institute of Technology, India
Dr. Sitaram Ramachandrula, Senior Director, Data Science, [24]7.ai, India
Shefali Singh, Student Department of ECE, Ramaiah Institute of Technology, India
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