

InternSync AI: Geolocation and Image Verified Internship Monitoring Web Portal

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Abstract: Engineering students are often required to complete internships at external organizations which makes it difficult for the faculty members to keep track of their attendance and progression throughout the experience. In many cases the update is limited to attendance sheet, diary, weekly report and feedback at the end of internship, making it harder to intervene if something goes wrong. In this paper, we propose InternSync AI, a web portal to help college monitor internships throughout their tenure. The proposed portal helps collate the information of internship registration, approval, attendance verification, supervisor feedback and compliance monitoring in a single window. The portal is designed to have six different user roles with access being given based on the responsibilities and department of the user. Attendance verification is expected to make use of the location service of the browser and an image capture upon check-in as evidence of location for review. We intend to use the reported accuracy of the location as a parameter before automatically verifying or sending an attendance report for manual verification. Issues that cannot be resolved automatically will be brought to a reviewer instead of marking the student for misconduct. In addition, the portal will have a compliance score based on certain criteria that will allow the coordinators to follow up with the students on incomplete activities and get recommendations for improvement where necessary. Since the portal is at the design phase, this paper will focus on the suggested architecture, verification rules and the intended outcome. It will not include performance analysis since no data will have been collected.

Keywords: Internship Monitoring, Geofencing, Haversine Formula, Image Evidence, Role-Based Access Control, Compliance Score, Django, Web Portal

I. INTRODUCTION

For the majority of engineering students an internship is the first extended experience in a working environment. The college gives credit for it but remains unaware of most of its aspects. Attendance is a signed document, progress a report written around the deadline and the host company's opinion reaches the faculty late or not at all. A coordinator with many students can barely observe who has failed to attend.

Previous work addresses fragments of the whole, attendance apps verify that a phone is within a certain area by using geofencing usually the Haversine formula while internship tools track hours, tasks, registration or evaluation. Reported problems include lack of accuracy indoors and using a single radius for sites of varying size. These conclusions suggest a rule taking into account the uncertainty of the location, and to consider a photograph as something a reviewer can examine and not proof. InternSync AI is our proposal for Jaihind College of Engineering, Kuran affiliated to Savitribai Phule Pune University. It incorporates registration, approval, supervision, attendance verification and compliance analytics in a browser-based portal. The project has not been developed yet so this report describes the design, rules we'll implement and the results we'll expect. Anything marked as expected is a projection based on the design and not a measurement.



II. OBJECTIVE

- To design a browser-based portal, which doesn't require a separate application to be installed, for students, faculty supervisors, internship coordinators, heads of department, company supervisors and an administrator.
- To check attendance at the time of check-in by using the device's location and a live photo and to send doubtful cases to a person.
- To restrict every user to the records of their own department, with the check done on the server.
- To compute a compliance score, which can be explained, and so a student who is falling behind can be helped early.
- To pass company-supervisor feedback through the internship coordinator before it reaches the faculty and the head of department.

III. LITERATURE REVIEW

- [1] Narasimhaiah et al. (2026) present a placement and internship system, featuring role based access, eligibility checks and tracking of status, functionally tested in a simulated environment.
- [2] Roja et al. (2026) came up with a mobile application, backed by a Node.js and MySQL database, for checking location and taking a live selfie. A seven day trial on campus reports an accuracy of more than 95% but does not evaluate facial matching and spoofing.
- [3] Yuvasri and Hariprasad (2026) propose a portal for task assignment and feedback, without any location or image verification.
- [4] Assalaarachchi et al. (2025) discuss digital supervision and evaluation of internships in a more general sense.
- [5] Barrocan et al. (2025) record interns' working hours with clock-in and clock out photographs in a Laravel and MySQL backed system, their survey of 50 respondents measuring the usability but not the detection of false attendance.
- [6] Tamboli et al. (2024) describe a geofencing system for general attendance management, similar in approach to and but without the focus on internships.
- [7] Jaafar et al. (2017) cover registration, eligibility, visits, monitoring and supervisor assessment for industrial training.

A. Research Gap

The works on general attendance and the internship tools have different limitations and utilise mostly usability, reported performance or functional testing as an evaluation metric. In the works we reviewed, none joins an accuracy aware location decision, photographs kept for human inspection, department restricted access for several roles and an explainable compliance score within one solution. This statement only includes the works under our consideration.

IV. METHODOLOGY

A. Requirement Analysis

The roles, registration steps and monitoring rules are derived from how internships are conducted in our college currently, namely paper attendance, daily diaries, weekly reports and feedback from company supervisors.

B. System Design

A Django modular monolith with ten apps, MySQL database and private file storage, with role and scope checks on the server.

C. Implementation (Planned)

Python, Django, MySQL, HTML, CSS, JavaScript and Bootstrap, with the use of the browser's Geolocation and Camera APIs over HTTPS.

D. Testing and Calibration (Planned)

Field check-ins at surveyed points outdoors, at a building edge and indoors; simulated check-ins from a noise model fitted to these readings; synthetic cohorts to assess how scores react to variations in weights and thresholds; a role-by-object authorisation matrix.



E. Pilot (Planned)

A consented pilot with students after institutional approval, to measure usability and reviewer workload.

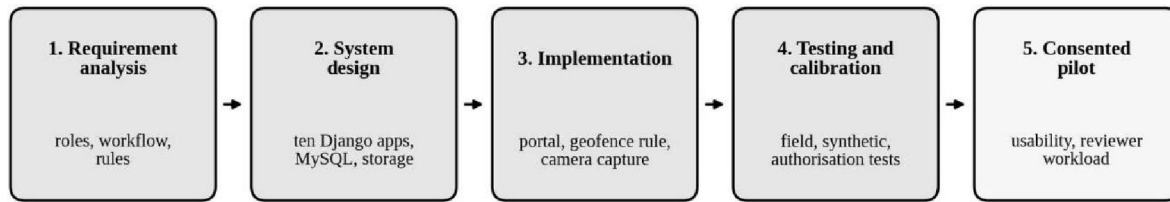
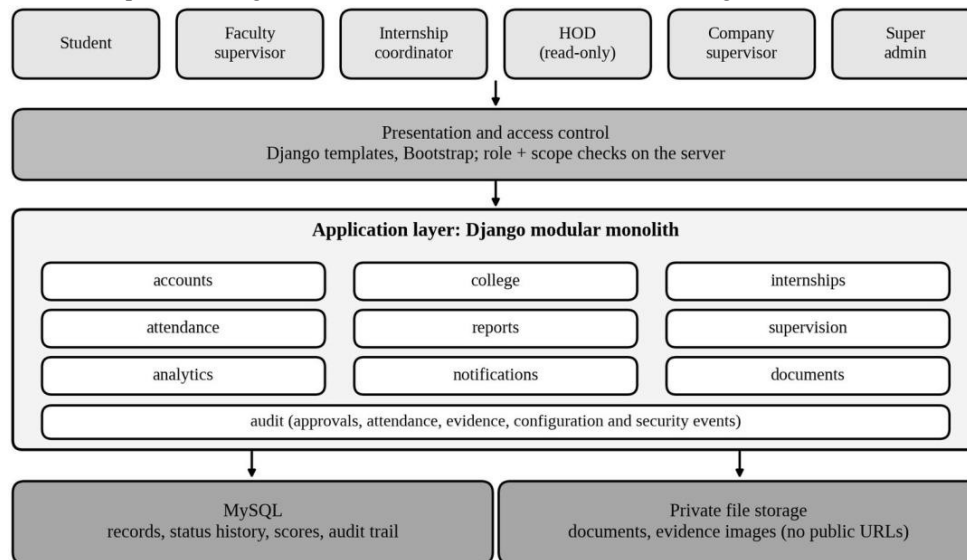


Fig. 1. Methodology of the InternSync AI project

V. SYSTEM ARCHITECTURE

Fig. 2 shows the envisaged system architecture. A modular monolith is chosen because it simplifies deployment, debugging, and database transactions for a small team. The users of the portal are organized into six groups and access the web application through a browser. Notably, MySQL stores relational data such as records, status history, scores, and audit trail whereas private storage is used to host documents and evidence images.



Browser APIs on the client: Geolocation, Camera (HTTPS only)

Fig. 2. Planned system architecture of InternSync AI

A. Software Components

The accounts module handles invitation, and sign-in. College manages the department, year, class, and division hierarchy. Internships deals with the application state transition workflow. Attendance stores check-in details. Reports keeps diaries and weekly reports. Supervision manages faculty and company supervisor relationships. Analytics computes scores, and review priority. Notifications handles email alerts. Documents stores private files, and audit logs approvals and evidence submission.

B. Roles and Access Control

A student views only their own records. Faculty supervisor accesses only the assigned students, and a coordinator approves applications and collates company feedback. The head of the department has read-only access to their own students' records. Company supervisors view only the assigned interns, and the administrator takes care of the college hierarchy and invitations. Access control follows a two-tier principle; one specifies the actions that a role can perform

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whereas the other determines what data the role can access. The access is enforced at the server level with deny as the default, thus preventing tampering with direct object references. This is in addition to the roles defined in.

C. Registration Workflow

A student registers using an invitation email sent to an official college email address. The invitation link contains a random, time-limited, and non-reusable token, and registration proceeds without a password. The application status workflow proceeds through DRAFT, SUBMITTED, FACULTY_REVIEW, CORRECTION_REQUIRED, FACULTY_VERIFIED, COORDINATOR_REVIEW, APPROVED, ACTIVE, and COMPLETED. Every approval is recorded.

D. Location Verification

At check-in or checkout, the browser gives the latitude and longitude, and the accuracy as a number representing approximate distance in meters using the Geolocation API. Besides, the server adds its timestamp when processing the location request. The location is requested only at check-in or checkout, and not continuously for power optimization. The server compares the location with the approved site coordinates, which the student cannot alter, using the Haversine formula:

$$d = 2R \arcsin \sqrt{\sin^2 \left(\frac{\Delta\phi}{2} \right) + \cos \phi_s \cos \phi_c \sin^2 \left(\frac{\Delta\lambda}{2} \right)} \quad (1)$$

where d is the distance in meters, R is the Earth's radius (mean value 6,371,000 m), ϕ_s and ϕ_c are the student's and company's latitude in radians, $\Delta\phi$ is the difference in latitude, and $\Delta\lambda$ is the difference in longitude. The accuracy a is the estimated accuracy of the position, and its value depends on the implementation of the browser; therefore, it is used as a hint and not as a guarantee. The fence radius is r and $a_{\max}$ is the maximum accuracy that the server allows for automatic verification. The test $d > r + a$ (Fig. 3) filters out the far points from the near points for automated review, but the latter are not automatically rejected. The two values, r , and $a_{\max}$ are company-specific; thus, they will be set using $r = 150$ m and $a_{\max} = 100$ m as a baseline and then tuned to production using empirical data. Table I shows how the location verification rules are applied.

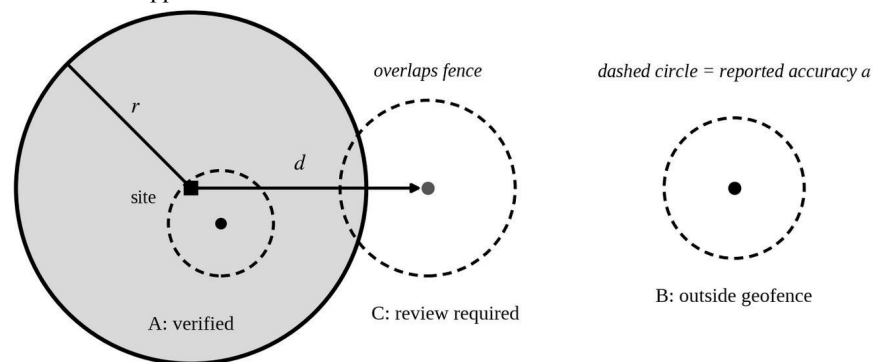


Fig. 3. Three check-ins around a geofence of radius r . A is verified, C overlaps the fence once accuracy is taken into account and goes to review, and B lies completely outside.

TABLE I: ATTENDANCE OUTCOMES AND HANDLING (DESIGN)

Outcome	Condition	Handling
LOCATION_UNAVAILABLE	No fix (denied, timeout, unsupported)	Recorded; retry allowed; review if unresolved
LOW_ACCURACY	$a > a_{\max}$	Recorded; retry encouraged; review queue
OUTSIDE_GEOFENCE	$d > r + a$	Recorded with evidence; review queue; not a fraud label



REVIEW_REQUIRED	$r < d \leq r + a$	Reviewer decides from distance, accuracy and image
IMAGE_CAPTURE_FAILED	$d \leq r$; required image missing or invalid	Recorded; retry or review
VERIFIED	$d \leq r$, $a \leq a_{\max}$, image present if required	Counts as verified attendance

E. Image Evidence

Where enabled, the student takes a live photograph via the browser camera. The image is securely saved and associated with the student, internship, event, server timestamp, coordinates, accuracy, distance and outcome. No facial recognition, biometric comparison or liveness detection is performed. A photograph deters casual misrepresentation and provides something for the reviewer to see, but does not identify the student, nor does it establish location beyond what the coordinates say, which the client can fake. Human judgement is still needed.

F. Compliance Score

The score reflects documented internship activities being performed and verified; it does not capture learning or proficiency. Its six components and initial weights are attendance (0.30), weekly reports (0.20), supervisor verification (0.20), project progress (0.15), daily activity (0.10) and documents (0.05). Each c_k is a ratio between 0 and 1, indicating the fraction of days with results versus expectations, such as verified days against working days due. With A being the set of components contributing to the score at the time of calculation, the formula is

$$S = 100 \times \frac{\sum_{k \in A} w_k c_k}{\sum_{k \in A} w_k} \quad (2)$$

A component applies to a student once at least one of its items is due. Items which are due but missing lower c_k , items not due yet are ignored, and no missing item gets full marks. The coverage κ , the sum of w_k over A , is displayed next to S and whenever it is below a configurable minimum the portal displays “insufficient data” where a score would be. Unresolved attendance outcomes are considered unverified until a reviewer chooses, and every change is logged with its reason. A rule-based classifier also provides a Low, Medium or High review priority from configurable thresholds and lists the rules that fired; it is a monitoring aid and nothing is approved or penalised automatically.

G. Security and Privacy

The plan includes hashed passwords, CSRF and XSS protection, parameterised queries, hashed one-time invitation tokens, validated uploads stored outside public directories, secrets in environment variables, HTTPS and an audit log. Locations and photographs are personal data so are captured only on check-in events, only the values needed for review are kept, and access is restricted and logged. The retention period and student notice must be agreed with the institution, and any study using real students requires permission and informed consent.

VI. RESULTS

As the portal was not built, no measured results are present. All that can be said now is an outcome of the rules outlined in Table I for typical situations with initial values of $r = 150$ m and $a_{\max} = 100$ m. Table II lists these expected results, which are a direct consequence of the design and will be compared with the actual readings during the field testing.

TABLE II: EXPECTED OUTCOMES FOR TYPICAL CHECK-IN SITUATIONS

Situation	d (m)	a (m)	Expected outcome
Student at the main gate, good fix	20	10	VERIFIED
Student at a building edge, inside the fence	145	25	VERIFIED
Just outside the fence, uncertain fix	165	30	REVIEW_REQUIRED



Clearly away from the site	400	15	OUTSIDE_GEOFENCE
Indoors with a weak fix	30	180	LOW_ACCURACY
Location permission denied	-	-	LOCATION_UNAVAILABLE
Inside the fence, required photograph missing	40	15	IMAGE_CAPTURE_FAILED

A. Expected Benefits

Coordinators to have one place to see attendance, reports and supervision together; a person to have the final say on every uncertain location check; students near a building edge to be sent to review and not rejected; and a lagging student to be noticed during the internship and not at its end. Under the default-deny rule, requests for another department's or another student's records are expected to be refused in every case of the authorisation test matrix. These are design expectations, and they will be reported as results only after testing.

B. Limitations

Location evidence from a browser is weak by nature: coordinates and photographs can be altered, indoor accuracy is poor, devices differ and a fixed radius may not suit every site. The weights and thresholds are starting values without field data, the score reflects completion of documented activities and not their quality, and the design addresses one college.

VII. BENEFITS TO SOCIETY

InternSync AI aims to make internships more accountable without creating surveillance. This allows colleges to obtain earlier and more equitable oversight of student performance, students to explain a missed check-in and receive help while the internship is ongoing, and companies to have a light-weight means of verifying attendance and receiving feedback. The portal keeps human oversight of ambiguous situations and only collects the data that is necessary, allowing for enhanced educational outcomes and an enhanced technology-enabled approach according to SDG 4 and SDG 9.

VIII. CONCLUSION

This report described the design of InternSync AI, a web portal for monitoring internships in an engineering college. Its key ideas were department-wise access for six roles, a location rule that considered the device's reported accuracy and ended in human review, photographs used as review evidence and not as proof, and a compliance score that was open about missing data. The portal is yet to be built; the next step is to implement it, test as described, and report actual results.

IX. FUTURE SCOPE

After implementation, radius, accuracy limit, weights and thresholds will be calibrated using field data gathered in two or three internship cycles. Later versions may include a light Android wrapper with background sync, push notifications for pending reviews, offline caching of check-in evidence, an image-quality check that prompts a retake, summaries of weekly reports drafted by a language model for human review only, and deployment across several colleges with institution-specific retention and consent rules.

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