

AMNESIA PATIENT: SMART MEMORY MANAGEMENT AND TECHNIQUES

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Abstract: Amnesia can lead to loss of ability to remember daily tasks, personal activities and ensures difficulty in maintaining their own safety. This condition forces patients to rely heavily on caregivers for guidance and daily management. The proposed project, “Smart Memory and Safety Assistant for Amnesia Patients,” represents a mobile application designed to help users regain independence and confidence. The interface includes customizable schedules for medicines, appointments and daily routines. Features such as facial recognition, adaptive voice guidance, and intelligent reminders collectively act as a virtual caregiver to support memory-impaired patients in their day-to-day life.

Index Terms - Amnesia, digital assistant, memory support, face recognition, safety alerts.

I. INTRODUCTION

Disorders like PTSD and drug addiction are tough to treat because they often come back even after treatment. Right now, treatments like medicine and exposure therapy help some people, but they don’t always work long-term. A new idea “memory reconsolidation” suggests that memories can be regained when they’re brought back to our mind. To make this idea work, scientists have to find out how to unlock or regain weakened memories and it’s still a difficult task for them [1].

Changing emotional memories are the hardest, which can lead to serious problems like PTSD and phobias. These conditions are often common and affect millions of people’s daily lives. Many traditional treatments have had only limited success rate, by researching memory reconsolidation shows that, by recalling a particular memory makes it temporarily flexible, it allows it to be weakened or changed. Continuing research in this area can help to create many useful therapies that are more effective and last longer. And learning to change harmful memories could improve the lives of people who struggle with trauma and anxiety [2].

People with this condition called “visual hallucinations” use to see things that aren’t there, it is still complicated to understand completely. Many theories have been made about this condition; each represents different reasons based on the patients. To visualize these things together, the researchers made an integrated visual hallucination framework that brings these views together. This helps to identify the beginning and end of the hallucination and helps us to identify new treatments. Mostly it lets us offer clear ways to reduce stress for the patients [3].

Alzheimer’s disease is one of the biggest health problems for older people and is among the top ten causes of death. Since there’s no cure yet, treatment mainly focuses on slowing down the disease and helping patients live better lives. In Sri Lanka, many people with Alzheimer’s don’t have regular access to proper treatment because of limited resources and facilities like the Alzheimer’s Foundation. Our research introduces a computer-based app designed to support patients through activities that strengthen memory, communication, and fine motor skills, guided by psychiatrists. This application is also used to track each patient’s progress and includes some features to keep them interested. In these ways, the application improves both independence the patients [4].

A complex mental illness named “Dissociative identify disorder (DID)”, where people Have trouble with accessing memories connected to their different identities. This is known as interdictory amnesia (IIA), and it leads to raises of questions about whether it’s real memory loss or something created by how individuals felt. A review looked onto nineteen studies and four case studies, with twelve included in several meta- analysis. These studies suggested that some memory sharing happens across identities, some studies showed patterns that seem more like IIA [5].

The case of patient named Henry Molison (HM) is known as the beginning of modern memory research. A debate was taken about whether Henry Malison (HM), who had damaged the medial temporal lobe, forgot things faster than the other memory loss patients and healthy people. Some studies from early stages thought that he forgot fast, but later some studies proposed that his memory loss was normal. The results showed how hard it is to compare patients with healthy people. Some new methods re- analyzed by the data showed that HM’s memory loss condition was like the healthy people, this leads to a better understanding of how important it is to do experiments carefully on memory loss related research [6].

A memory problem named “Accelerated long-term forgetting (ALF), where people remember things well for a short period of time and forgets them for long period of time, it can vary up to days or weeks. In early stages standard tests usually check on only short-

term memory, so ALF is often missed by the tests. Research suggests that this ALF condition can appear early in Alzheimer's disease and similar conditions like mild cognitive impairments, indicates that it could be a sign of brain changes. So, recognizing ALF in the early stages and it could be better to track patient's medical settings [7]

The study explores what happens in the brain when someone with severe amnesia tries to follow and remember realistic video events. It focuses on episodic memory and how it usually relies on interaction between the hippocampus and wider cortical regions over time. The authors note that, even with dense amnesia, people can still track what is happening in rich, continuous scenes, suggesting that some aspects of understanding events do not fully depend on the hippocampus. Amnesia messes with the brain's memory system, found by using the MRI scans on videos of real-life scenes. Some strokes in the thalamus of a guy named TF who is 75-year-old, this caused him to have bad memory. He watched short videos and understood the videos but couldn't remember anything afterwards. The posterior midline cortex of his brain didn't connect well with his left hippocampus while watching or trying to recall the videos. [8].

This new synthesis has eight models explaining complex visual hallucinations in seeing realistic people, animals, or objects which aren't there. Disorders like Lewy body dementia, Parkinson's, and eye disease where hallucinations feel as real as normal vision but have disrupted veridical perception. This highlights sensory data from eyes, expectancies, attention, and some prediction errors. [9].

The remaining article describes three cases of transient epileptic amnesia seen in a memory clinic, a condition that often mimics dementia at first presentation. These middle-aged and older patients experienced repeated short episodes of amnesia, typically on waking from sleep, while other cognitive functions seemed relatively preserved during attacks. Detailed assessments, including imaging, EEG, and neuropsychological testing, revealed temporal lobe epileptic activity and significant problems with both recent and autobiographical memory. Treatment with antiepileptic medication reduced or stopped the overt amnesic episodes, but some autobiographical and remote memory difficulties persisted, underlining the need to include transient epileptic amnesia in the differential diagnosis of dementia and to study its long-term memory consequences more closely [10].

One of the attached articles investigates how reminders and new learning can change the way long-term declarative memories are expressed in humans. Across several experiments, participants first learned lists of images or foreign-language word pairs, and then received reminders followed by either interfering learning or demanding cognitive tasks on later days. The researchers found that post-reminder interference can alter later recall, but the specific pattern of change depends on the type of material and task, sometimes causing more intrusions and sometimes reducing accurate recall. These findings support the idea that reminder-triggered processes can make memories malleable, yet they also highlight that it is still unclear whether the observed effects reflect genuine reconsolidation impairments or other forms of interference [11].

The researchers have developed waterborne-epoxy/sodium silicate composite binders for bonded Nd-Fe-B magnets that boosts high-temperature resistance, corrosion resistance, and provide strength for EV motors. It chemically modifies epoxy for better SS compatibility, ununiformly coating powders during mixing/curing to shield from oxidation and salt spray. The magnets show Br=6.28 kg, Ch=9.73 Koe, compressive strength=95 MPa, due to the Si-O-Si + C-O-C networks. The engineers mix water-epoxy + sodium silicate for super tough Nd-Fe-B magnets in the EV motors that hold shape at 200°C. Great for complex shapes without wasteful sintering. [12].

The robot named Alzheimer Care Companion (ACCR), it uses pepper humanoid for Kuwaiti Alzheimer's patients, speaking Arab Kuwaiti dialect to trigger memories via 271 dialogs. ACCR detects faces, family members, relationships, hobbies, war of liberation, shows personalized images, videos, scheduled tasks, pills, prayers, aiding cognition, emotion without replacing the caregivers. Framework: interviews, requirement, dialogs, deploy, it's the first Arabic robot for 55M+ global dementia cases [13].

One of the attached studies develops an explainable machine learning pipeline to detect Alzheimer's disease early using structured electronic health record data rather than expensive imaging or invasive tests. The authors clean and preprocess a rich clinical dataset, then compare several models and select Gradient Boosting because it offers the best balance of accuracy and generalization across metrics like precision, recall, and F1 score. To avoid the "black box" problem, they integrate SHAP explanations so clinicians can see which variables, such as MMSE scores, daily living abilities, and cholesterol levels, most strongly influence each prediction at both global and individual levels. Finally, they wrap the model in a lightweight Streamlet web app that lets users input patient data, obtain real-time risk estimates, and visualize which features drove the output, aiming to make the tool practical for telehealth and remote decision support [14].

Another paper investigates how different levels of urbanization in China relate to changes in disability after stroke, measured with modified Rankin Scale scores. Using a large nationwide cohort, the authors find a U-shaped association: both very low and very high urbanization are linked to worse functional outcomes, while intermediate levels appear more favorable. They discuss how access to healthcare, environmental conditions, and co-existing health problems might interact with urbanization to shape recovery, and they call for more precise environmental measures and mediation analyses in future work [15].

Another work describes "MEDIBOX" (or MEDIKIT), a smart IoT-enabled medicine box designed for older adults and people with chronic conditions who struggle to follow complex prescription schedules. The box contains multiple sub compartments that can be programmed with exact times and doses; when it is time to take a pill, the system gives an audiovisual reminder and dispenses only the required tablets to avoid confusion or dosing errors. Connected through Internet of Medical Things technologies, the device

seeks to reduce missed doses, under- and overdosing, and the overall burden on caregivers who would otherwise need to manage medication manually [16].

An Android-based dementia care app is presented that helps patients, caregivers, and family members manage everyday life more safely and independently. The app runs on standard phones and combines GPS-based location tracking, medicine reminders, a to-do list, route guidance back home, fall detection using the phone’s sensors, and automatic location sharing in emergencies. The authors argue that such a tool can reduce the need to confine patients indoors, support their autonomy, and ease some of the burden on caregivers [17].

The tagalong device is a wearable device that tracks the locations of Alzheimer patients by using the GPS, and as a safety feature it sends SMS to the caregivers with an interval of 30 min via GSM. It contains pulse and temperature sensors used to monitor heart rate (BPM) and the body temp. If the reading exceeds the normal limit, then it flags HR for emergencies. The RTC triggers LCD/speaker to denote pill and food reminders that promote independence and reduce the family supervision burden. The MQTT android app shows the updated live maps and health logs. The components are GPS antenna, pulse sensor, temperature sensor, LCD, speaker relay [18].

Deme-assist is a Saudi-focused Android app aiding early and mid-stage Alzheimer patients with GPS tracking to prevent them from wandering and to enable the caregivers to pinout locations via maps. Along with vitals monitoring for heart rate, blood pressure, stress, and sugar levels which are based on the PPG. It has features like tasks reminders, notifications, mind games to boost memory and confidence of the patients. It has unique SIM alert system notifying base stations if the phone is destroyed, these all in a secure 3-layer architecture. It supports English, Arabic, and multilanguage access. This app helps the users like Admin, patient, caregivers, psychiatrist through registration, it’s done with the offline, but it requires continuous internet for further connectivity optimal for M2M communication [19].

The Dement Aid is a web application developed by using Node.js and mongo DB support featuring like News API that feeds on brain health. It has a “my circle” for caregiver-uploaded family photos enabling “guess who” quizzes to let them train on remembering faces of the family members and it has memory games to stimulate cognition, medication, appointment reminders easing daily challenges. It used to reduce the caregiver’s burden through personalized reminiscence therapy and progress tracking [20].

II SETUP AND IMPLEMENTATION

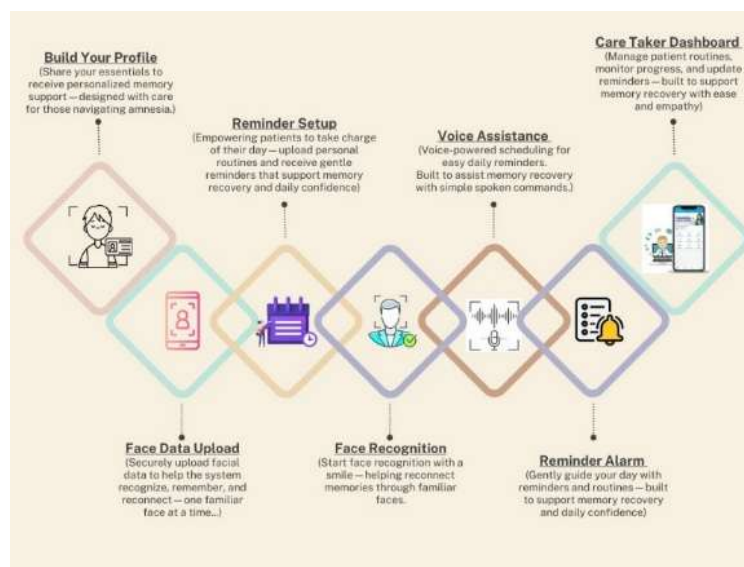


Fig. 1. System Workflow of Smart Memory Management for Amnesia Patients

Figure 1 illustrates the workflow of the smart memory support application which is designed for memory impaired patients who are affected by amnesia or early dementia disease. It begins with caregiver registration that comes along with the patient’s details, medications and emergency contacts details to ensure safety. Face recognition provides secure patient authentication, ensuring only authorized access and it provides permission for caregivers to login to make sure everything is under monitored. A voice assistant that monitors the activities and delivers spoken guidance for the patients to do their daily activities. The memory diary runs in the background that monitors and documents the activities and progress. This enclosed architecture monitors the patient’s activities and reduces the burden for the caregivers and family members.

A. Patient Enrollment and Data Initialization

The system starts with a user registration, where the patient or caregiver creates a profile by entering important details such as the patient's name, age, medical history, medicine details, and emergency contacts. All information is stored in a secure manner in the database. Caregivers can also upload photos of close relatives, which are later used for face recognition or identifying relatives of the patients, and set reminders for medicines, appointments, meals, and daily routines. This ensures that the app has complete information which helps to provide reliable support to the patient. In addition, the setup process personalizes the app to the patient's specific needs and becomes easy to use by the patient.

B. Intelligent Facial Identification Module

In this process, the app uses built-in camera and face recognition models like OpenCV to identify the person, and it is used for login into the app also. If the face matches a stored profile, the system displays the person's name and relationship, such as "This is your daughter, Priya." If the face is not recognized, the caregiver is notified, helping patients avoid confusion and providing needed support whenever memory lapses occur. This feature improves the patient's confidence in social situations among the surroundings. It also strengthens their ability to recognize loved ones and avoid feelings from isolated situations

C. Conversational Voice Interaction System

To make the system more user-friendly, especially for patients who are unknown with new technology, the app includes a voice assistant which will be more helpful for patients. It understands spoken commands and responds in a natural voice processing method. For example, when the patient asks, "What should I do now?" the app may reply, "You need to take your 2 PM medicine." If the patient asks about a person nearby, the assistant responds with their identity. The voice assistant reduces the need for manual navigation and supports patients with low literacy. It also acts as a virtual caregiver to the patient, which makes the app feel more interactive and supportive.

D. Smart Alert and Scheduling Framework

The system continuously checks stored reminders and gives alerts to the patient when it is time for a task to complete. Alerts can be delivered as notifications, sounds or voice messages, it also uses voice assistance for general reminders to assist patients. Caregivers also can update or add reminders remotely whenever it's needed. This reliable system builds a virtual environment for the patients' daily routine life. It helps patients remember every task which maintains their routine life peacefully.

E. Caregiver Analytics and Supervision Interface

The app also includes a caregiver dashboard which can be accessed through both mobile and web platforms. This dashboard enables caregivers to monitor the respected patient's reminders, activities, and emergency alerts in real time format. It also provides location tracking in emergency situations. This not only reduces the patient's burden but also offers peace of mind to the families. This is supported by technology and continuous monitoring by the caregiver. Caregivers can respond faster in a situation of emergencies. The dashboard also creates a combination of care environment between patients, families, and healthcare provided in it.

IV. RESULTS AND DISCUSSION

The Smart Memory and Safety Assistant app was built and tested using Flutter for Android, featuring patient profiles, a shared dashboard for caregivers and patients, a memory diary, med reminders, and alerts for daily tasks. It helps people with memory challenges stay on top of routines, medications, and appointments, giving them more independence in their day-to-day lives. Caregivers benefit from real-time updates and simple monitoring, making oversight less stressful. All in all, the app strengthens virtual support, boosts safety, and builds confidence for both patients and families.

Figure 2 shows how often Margaret Johnson (a patient) completed key daily activities across the week. The x-axis covers Monday through Sunday, while the y-axis tracks frequency. Each colored line represents a specific task—like Medication, Memory Diary, Meals, Exercise, and Emergency action revealing patterns in her routine.



Fig. 2. Weekly SMSA Activities – Margaret Johnson

The graph tracks how task completion rates climbed steadily among patients over six weeks, jumping from 55% in Week 1 to a solid 93% by Week 6. This clear upward swing shows users getting more engaged and comfortable with the system, thanks to smart combos like face recognition, timely reminders, and voice prompts that really help folks nail their daily routines on their own. That gradual boost points to patients settling into the app's rhythm, building habits with steady nudges and caregiver check-ins. It proves the Smart Memory Management System fills real cognitive gaps from amnesia, strengthening both quick-recall and longer-term memory through repetition that adapts to how they respond. The pattern also spotlights the system's smarts AI tweaks reminder times, tones, and frequency based on each person's patterns, syncing perfectly with their mental flow to cut fatigue and sharpen memory. Over weeks, this creates a self-reinforcing loop, shifting reliance from constant alerts to stronger inner habits and real independence. Beyond that, the results hint at long-haul rehab potential, not just short-term crutches. The smooth curve suggests ongoing use could lock in steadier thinking and routines for amnesia patients. Caregivers get a leg up too, via dashboards revealing daily wins and weak spots, blending tech, patient effort, and family support for better memory hold and emotional lift.

Based on the graph, medication reminders appear consistently every day, showing that this activity is followed most regularly. Meal reminders also remain steady throughout the week. Activities such as exercise, social interactions, and cognitive tasks vary across different days, with higher participation on days like Wednesday and Saturday. Overall, the chart gives a clear overview of Margaret's weekly habits and health-related activities.

A. Remainder Compliance Rate

The Reminder Compliance Rate (RCR) is one of the most significant performance indicators used to evaluate how effectively the Smart Memory Management for Amnesia Patient's applications help users maintain their daily routines and follow scheduled activities such as medication intake, meals, and doctor appointments. This metric directly reflects the system's capability to enhance memory recall and encourage patient independence through automated reminders and alerts.

RCR is calculated using the formula (1)

$$RCR(\%) = \frac{\text{Reminders Completed}}{\text{Total Reminders Generated}} \times 100 \dots \dots \dots Eq(1)$$

In this equation, Reminders Completed refers to the total number of reminders that the patient successfully acknowledges or acts upon (for example, confirming that medicine was taken or an appointment was attended). Total Reminders Generated denotes the total number of notifications or alerts issued by the system within a specific period. The resulting percentage value represents the patient's adherence rate to the prescribed schedule. In our project, this metric was used to analyze the effectiveness of the reminder and notification module over several weeks of system use. Each time the application sent a reminder, it tracked whether the patient responded through either voice confirmation, touch interaction, or automatic logging by the caregiver's dashboard. If the patient completed the task, the system marked it as "acknowledged." The total number of completed reminders was then compared with the total number of reminders generated to calculate the RCR value. For example, if the system generated 100 reminders in a week and the patient responded to 85 of them, the RCR would be calculated as (1).

$$RCR = 85/100 \times 100 = 85\% \dots \dots \dots Eq (2)$$

This value indicates that the patient successfully completed 85% of scheduled activities. A higher RCR percentage signifies that the system effectively supports patients in managing their daily routines, reducing forgetfulness, and maintaining consistency in their lifestyle. In our experimental analysis, the RCR showed a steady improvement over multiple weeks of observation, starting from around 65% in the first week and increasing to nearly 90% by the fourth week. This progressive rise demonstrates that patients gradually adapted to the system's reminders and developed more consistent behavior patterns. The improvement also

confirms the reliability of the voice assistant and intelligent reminder modules, which helped patients remember essential activities without caregiver intervention. Moreover, the upward trend highlights the system’s ability to reinforce positive routines and reduce dependency on external prompts. (2)

The consistency achieved over time suggests that the reminders not only improved adherence but also contributed to building long-term behavioral resilience. This outcome is particularly significant for patients with memory impairments, as it indicates that digital interventions can effectively complement traditional caregiving. Ultimately, the steady growth in compliance reflects both the usability of the system and its potential to enhance patient autonomy in daily life. Overall, the RCR metric validates that the Smart Memory Management System successfully enhances patient adherence, strengthens memory recall, and promotes a higher degree of independence, making it a crucial indicator of the application’s performance and real-world usability. The improvement also confirms the reliability of the voice assistant and intelligent reminder modules, which helped patients remember essential activities without caregiver intervention. (3)

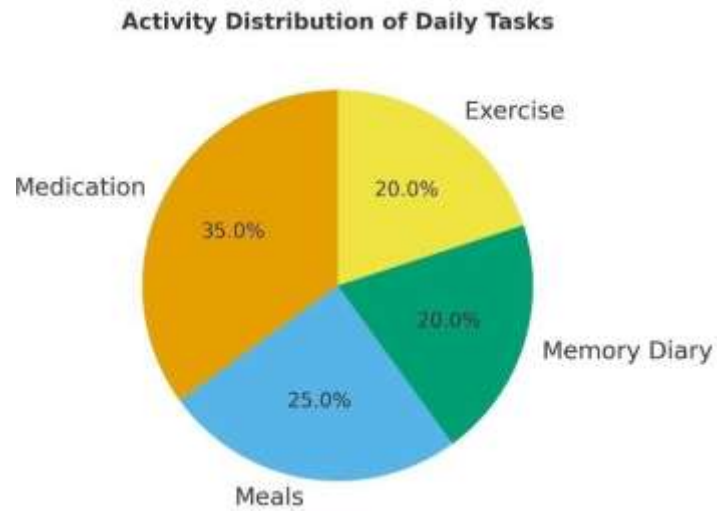


fig 3. Activity Distribution of Daily Tasks

Fig 3 pie chart shows the Activity Distribution of Daily Tasks performed by patients using the application. The chart reveals that medication reminders that account for 35% for Meals 25%, 20% for exercise, and memory diary entries for the rest 20% of total recorded activities. This distribution highlights that the system focuses primarily on essential health and cognitive support tasks that are critical for individuals with memory loss. The dominance of medication related reminders reflects the priority of maintaining regular drug adherence, which is crucial for cognitive stability and health management. Meanwhile, meal tracking ensures proper nutrition. This balanced task distribution confirms that the Smart Memory Management System is designed not just for reminders but as a everyday lifestyle assistant that integrates health, memory, and activity management.

B. Emergency Alert Response Rate

In Emergency Alert Response Rate (EARR) formula is applied to measure the real time reliability and response of the system’s emergency notification feature. When a patient manually triggers the SOS alert system, an emergency alert is instantly sent to the registered caregiver through both the mobile application and an automated SMS notification. After the alert is sent, the system continuously monitors whether the caregiver tracks the notification within a predefined response window (for example, within 30 seconds). If the caregiver confirms or responds to the alert within that time, it is counted as a successful acknowledgment. The EARR is calculated using the formula (3).

$$EARR(\%) = \frac{\text{Acknowledged Alerts}}{\text{Total Alerts Sent}} \times 100 \dots \dots Eq(3)$$

Where the value reflects the percentage of alerts that received a timely caregiver response. For instance, if out of 20 total alerts, 18 were successfully received and acknowledged by caregivers, the system’s EARR would be (4).

$$EARR = 18/20 \times 100 = 90\% \dots \dots Eq (4)$$

A high EARR value (typically above 85%) shows that the system can maintain reliable, real-time communication between patients and caregivers that minimizes the risk of delayed assistance. Therefore, it serves as an essential indicator of the system’s safety and overall effectiveness in managing emergency situations for memory weakened patients.

C. Visualization and Data Analytics

The Smart Memory Management System (SMMS) pulls together tons of patient data from reminders and activity logs to emergency alerts and daily interactions. To make sense of it all, the system uses clear visuals and smart analytics that turn raw numbers into practical insights. This setup lets caregivers track progress, spot trends in behavior, and make smarter calls on day-to-day care. It layers in both basic overviews and forward-looking predictions. Descriptive tools give a straightforward snapshot, like daily task completion rates or how quickly patients respond to alerts. Predictive AI takes it further, flagging risks like skipped routines before they snowball. This combo doesn't just recap the past it helps head off problems, keeping patients safer with proactive tweaks. Interactive dashboards make it all pop with line graphs for trends over time, heat maps for activity hot spots, and pie charts for quick breakdowns. Users can filter by date or task type, and everything updates live. No data science degree needed these visuals cut through the noise, helping patients see their wins and caregivers zero in on what matters most.

D. Data Collection and Processing

Data's continuously received from the application like completed reminders, SOS triggers, task timestamps, and memory diary entries that flows into a secure and encrypted database and then the data's are automatically cleaned and the inputs are categorized. The data's are synchronized into a real-time across the application, cloud backend and the caregiver dashboard consists of every information.

E. Visualization Techniques

Visuals turns complex patient data's into a intuitive, easy insights for the smart memory support application and it makes the memory care easily accessible for those who are affected under cognitive challenges. Line graphs tracks the reminder rates over every weeks, displaying the patterns which are easy to understand the improvement in the medication compliance, and it increased from 62% to 89%. High risk and low risk period times are denoted by the color gradients like if the cool blue means safe and the red means the patient needs and urgent care by the caregivers. Caregivers access the every diagnostics through the application.

F. Behavioral Pattern Analysis

The system sifts data for habits, like chronic med delays or forgotten reminders, signaling early dips in cognition. Timeseries maps plot engagement ups and downs say, motivation drops after lunch prompting quick fixes. It builds evolving profiles from response speeds and interaction lengths, splitting one-off slips from bigger shifts. Anomaly detectors ping oddities, like sleep disruptions hinting at stress. Layering in context (time of day, noise levels) uncovers ties, like evenings dragging, and suggests tweaks like rescheduled tasks. This sharpens care, boosts safety, and fuels rehab.

G. Predictive and Descriptive Analytics

Descriptive side sums up history: adherence scores, completion rates, system uptime. Predictive AI scans for trouble ahead, like routine drifts, firing early warnings to caregivers. Over time, it learns from chronic skips at dawn. And auto-adjusts reminders or flags issues. Dashboards blend past recaps with future outlooks for spot-on planning. Models retrain fresh data, factoring in time/place/mood, turning the system into a self-tuning brain that cuts manual work and amps personalization

H. Caregiver Dashboard and Reporting

Cloud dashboards beam real-time stats, graphs, and summaries, with downloadable weekly/monthly reports packed with visuals and engagement breakdowns. Spot progress, tweak plans, gauge treatments all immediately. Smart alerts flag misses, inactivity bursts, or SOS hits, with custom thresholds. Remote access pulls in docs for team huddles. Longterm trend views nail improvements or red flags, blending live pings with history for hands-off, tailored oversight that keeps care sharp and steady.

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REFERENCES

- [1] Milton, A. L., Das, R. K., & Merlo, E. (2023). The challenge of memory destabilization: From prediction error to prior expectations and biomarkers. *Brain Research Bulletin*, 194, 100–104.
- [2] Kindt, M., & Elsey, J. W. B. (2023). A paradigm shift in the treatment of emotional memory disorders. *Brain Research Bulletin*, 192, 168–174.
- [3] Cullerton, D. et al. (2023). Understanding visual hallucinations: A new synthesis. *Neuroscience & Biobehavioral Reviews*, 150, 105208.
- [4] Weerakoon, D. S. D. et al. (2018). Memory improvement tool for dementia Alzheimer's patients. *Procedia Computer Science*, 141, 413–420.
- [5] Beker, J. C. et al. (2024). Inter-identity amnesia and memory transfer in dissociative identity disorder. *Clinical Psychology Review*, 114, 102514.
- [6] Peng, N. et al. (2024). Did H.M. exhibit accelerated long-term forgetting? *Cortex*, 180, 35–41.

- [7] Rodini, M. et al. (2022). Accelerated long-term forgetting in neurodegenerative disorders. *Neurosci. & Biobehavioral Reviews*, 141, 104815.
- [8] Oedekoven, C. S. H. et al. (2019). Effects of amnesia on hippocampus during memory tasks. *Neuropsychologia*, 132, 107104.
- [9] Ioannidis, P. et al. (2011). Transient epileptic amnesia in memory clinic setting. *Epilepsy & Behavior*, 20(3), 414–417.
- [10] Faisal, M. et al. (2024). Robot-based solution for helping Alzheimer patients. *SLAS Technology*, 29, 100140.
- [11] Govindarajan, R. et al. (2025). Explainable machine learning model for Alzheimer's disease prediction. *MethodsX*, 15, 103491.
- [12] Pandhi, S., & Tiwari, R. (2022). Dementia care: An Android application for assisting dementia patients. *IEEE ICIEM Conference*.
- [13] Joshi, D. et al. (2023). DementAid: A web app for dementia support. *IEEE ICIRCA*, 2023.
- [14] Govindarajan, R., Thirunadanasikamani, K., Napa, K. K., Sathya, S., Murugan, J. S., & Chandi Priya, K. G. (2025). Development of an explainable machine learning model for Alzheimer's disease prediction using clinical and behavioural features. *MethodsX*, 15, 103491.
- [15] Liu, H., Tong, M., Cao, M., Li, J., Lu, H., Wang, R., Yang, X., Guan, T., Xue, T., & Liu, Y. (2023). The U-shaped association between urbanization and post-stroke disability: A nationwide longitudinal study in China. *Global Transitions*, 5, 1–9.
- [16] Banu, S., Mohmudiya, S. A., Rahiba, N., & Anmol, S. (2022). IoT enabled patient medicine intake tracking system—MEDIKIT. In *Proceedings of the Sixth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC-2022)* (pp. 67–70). IEEE.
- [17] Pandhi, S., & Tiwari, R. (2022). Dementia care: An Android application for assisting dementia patients. In *Proceedings of the 2022 3rd International Conference on Intelligent Engineering and Management (ICIEM)* (pp. 356–361). IEEE.
- [18] Lobo, M. A., Sowmya, K., Mimani, H., & Savanth, A. S. (2023). TagAlong: An assistive device for Alzheimer patients. In *Proceedings of the 2023 International Conference on Intelligent and Innovative Technologies in Computing, Electrical and Electronics (IITCEE)* (pp. 342–347). IEEE.
- [19] Tabassum, K., Alharthi, R., & Yousuf, R. (2023). An intelligent mobile application for helping Alzheimer patients. In *Proceedings of the 2023 Tenth International Conference on Software Defined Systems (SDS)* (pp. 1–11). IEEE.
- [20] Joshi, D., Abhyankar, A., Sawakare, C., Khandare, S., Shevate, S., Agarwal, N., & Parakh, P. (2023). DementAid: A comprehensive web application for dementia's support and memory enhancement. In *Proceedings of the 2023 5th International Conference on Inventive Research in Computing Applications (ICIRCA)* (pp. 1858–1865). IEEE.

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