A.I. Aids the elderly

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Introduction

What is the problem?

There are a lot of elderly people who stay at home and don’t have anyone to take care of them. They struggle in silence to do daily chores and often suffer from loneliness.

Why it matters:

As we get older elderly care gets less affordable. Social security is also disappearing and many elderly people die alone in their homes. Many Elderly people also get into car accidents because they get the pedals confused or can’t react quickly enough to other cars.

Current Solutions:

Apple Watch:

- Apple Watch has a feature that uses an accelerometer to detect a fall. The watch vibrates your wrist, sounds an alarm, and sends a notification.
- If it doesn’t detect movement in a minute it starts a 30 second countdown. If the countdown isn’t manually stopped it calls 911.
- It can also send your medical I.D. and contact your emergency contacts if those settings are turned on. However Apple has a disclaimer saying that it can’t detect all falls.

Sensi A.I

- Described as an 24/7 strategic care co-pilot, using audio technology with the highest level of precision to provide a 360-degree understanding of a senior’s needs. It is designed to help caregivers.
- It uses audio to also rate caregiver interactions, suggest action, and give the caregiver positive affirmations. The family can also tell the caregiver how to hand certain situations.

ElliQ

- An A.I. companion that can have deep conversations and play a wide variety of games.
- It can also connect to other elderly people’s hubs and help them make friends, or play games together.
- The A.I. can also facilitate calls, video chats, and sharing pictures with friends and family.
- It also can give reminders to take medication, or provide exercise and meditation videos. Then it can track their vitals to monitor their health.

QuietCare

- Uses a network of motion sensors placed throughout a their home. They monitor movement and learn their daily routines(when they wake up, go to the bathroom, eat, and move around the house.
- QuietCare analyzes the data collected by the sensors. If it detects significant deviations from the established routines or potential emergencies, it sends alerts to designated caregivers, family members, or monitoring centers.

Serena: What it would do

- Help perform errands around the house
- Have engaging conversations
- Transfer data into their cars to drive them to locations and assist with errands
- Monitor health and alert emergency contacts/ 911
- Help them call family and friends
  Can link to a separate site that provides workout videos or games to pass the

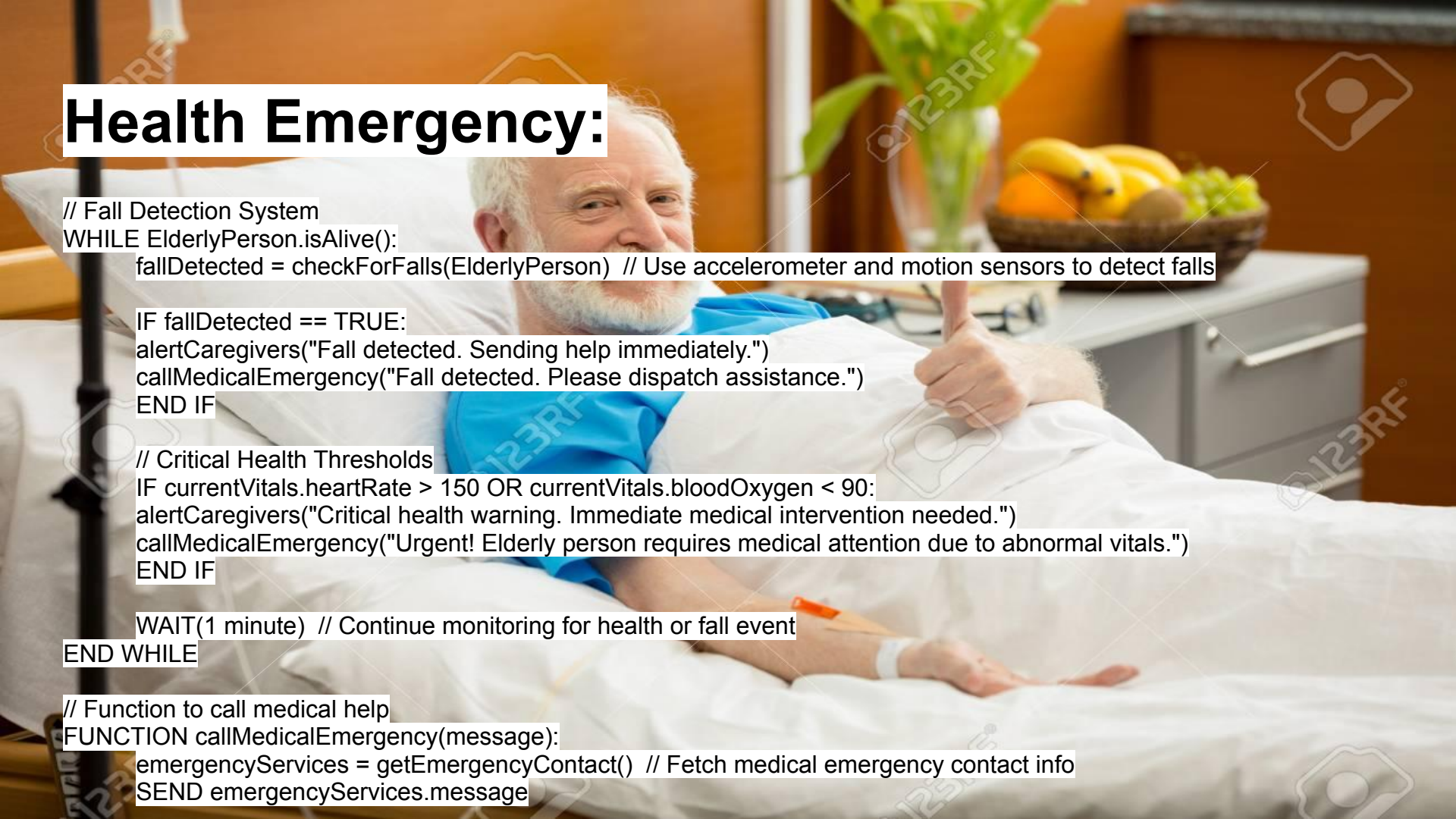
A Possible Solution

Solution: A.I.and eventually robots can be used to take care of the elderly if they don’t have any family to do it. They can also run errands for them so that they don’t have to leave their home. The elderly person doesn’t have to be alone as they get older and if they need medical attention there is someone to call it for them. Self driving cars can also mean that they can still drive places even if they can’t meet the requirements for a driver’s license anymore.

Design Proposal: Monitor health

```
Monitor Health:

// Health Monitoring Loop
WHILE ElderlyPerson.isAlive():
        currentVitals = readHealthData(ElderlyPerson)  // Read vital signs (e.g., heart rate, blood pressure)

        // Analyze Health Data
        riskLevel = analyzeHealthRisk(currentVitals)  // Use AI/ML model to assess health risk (e.g., high blood pressure)

        IF riskLevel == "high":
        alertCaregivers("Elderly person's health at risk. Immediate attention required.")
        suggestHealthMaintenance(currentVitals)  // Suggest lifestyle changes (e.g., reduce salt intake, daily exercise)

        IF currentVitals.heartRate > 120:
        suggestRestAndHydration()  // Suggest rest and fluid intake if heart rate is elevated

        WAIT(5 minutes)  // Wait before next health check
END WHILE

// Function to suggest health maintenance
FUNCTION suggestHealthMaintenance(vitals):
        IF vitals.bloodPressure > 140/90:
        suggest("Consider reducing sodium intake and increasing physical activity.")
        ELSE IF vitals.sleepHours < 7:
        suggest("You should aim for 7-9 hours of sleep for better health.")
        END IF
```

Health Emergency:



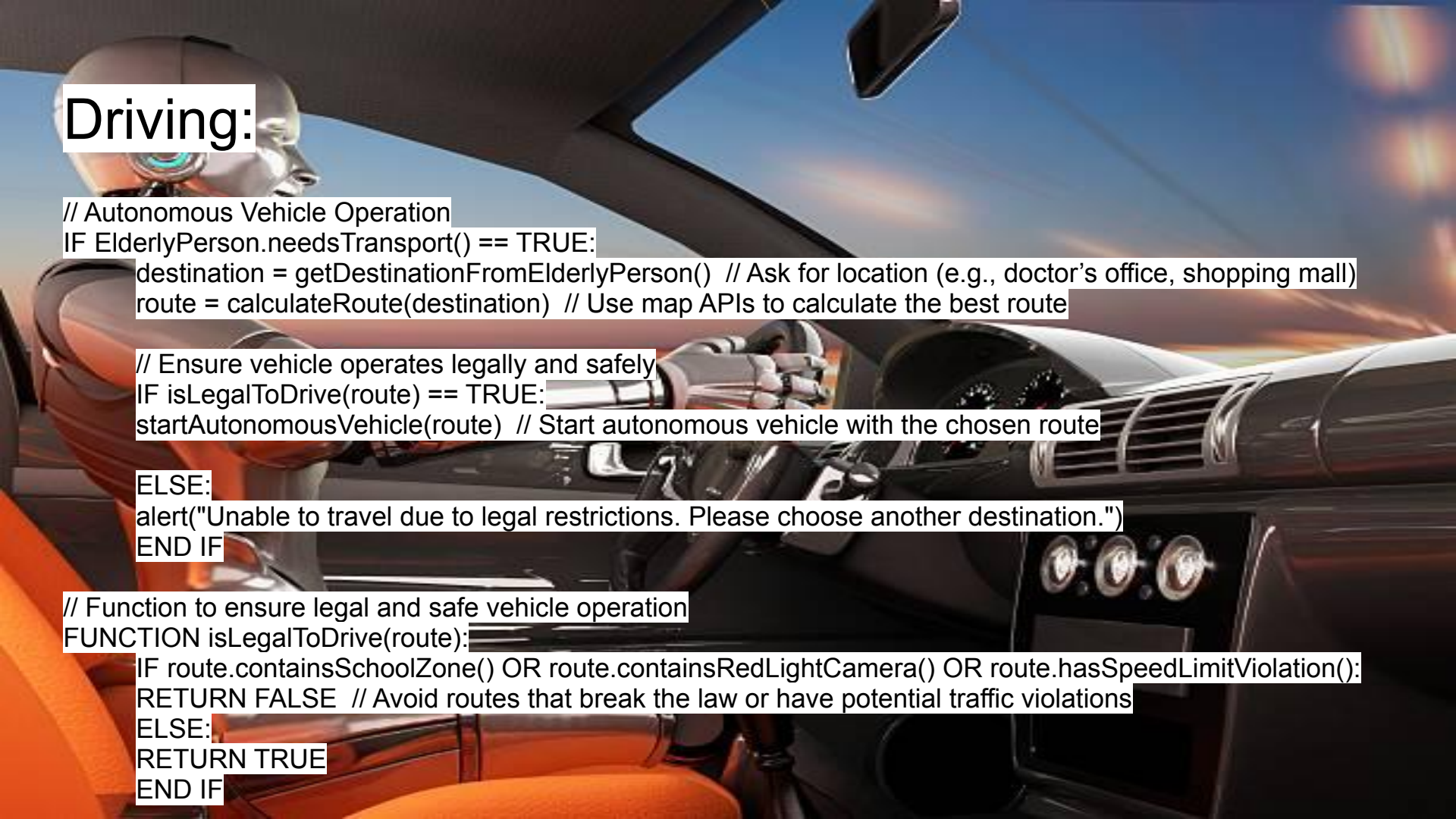
```
// Fall Detection System
WHILE ElderlyPerson.isAlive():
    fallDetected = checkForFalls(ElderlyPerson)  // Use accelerometer and motion sensors to detect falls

    IF fallDetected == TRUE:
    alertCaregivers("Fall detected. Sending help immediately.")
    callMedicalEmergency("Fall detected. Please dispatch assistance.")
    END IF

    // Critical Health Thresholds
    IF currentVitals.heartRate > 150 OR currentVitals.bloodOxygen < 90:
    alertCaregivers("Critical health warning. Immediate medical intervention needed.")
    callMedicalEmergency("Urgent! Elderly person requires medical attention due to abnormal vitals.")
    END IF

    WAIT(1 minute)  // Continue monitoring for health or fall event
END WHILE

// Function to call medical help
FUNCTION callMedicalEmergency(message):
    emergencyServices = getEmergencyContact()  // Fetch medical emergency contact info
    SEND emergencyServices.message
```

Errands:

```
// Task Assistance System
WHILE ElderlyPerson.isAlive():
    taskRequest = listenForTaskRequest(ElderlyPerson)  // Listen for voice or app input asking for tasks (e.g., "order groceries")

    IF taskRequest == "order groceries":
    groceryList = generateGroceryList(ElderlyPerson)  // Create a shopping list based on past preferences
    ORDER groceries from online grocery service  // Use an API to order groceries

    ELSE IF taskRequest == "schedule doctor appointment":
    appointmentDetails = fetchDoctorAvailability()  // Check doctor availability based on health history
    SCHEDULE appointment with doctor

    ELSE IF taskRequest == "turn on lights":
    smartHomeSystem.turnOnLights()  // Control home automation (e.g., lights, thermostat)
    END IF

    WAIT(5 minutes)  // Wait for next task request
END WHILE
```

Personality:

```
// Learning about Elderly Person's Preferences
WHILE ElderlyPerson.isAlive():
    interactionData = recordInteractionData(ElderlyPerson)  // Track data from conversations, tasks, and health

    // Learn Personal Preferences
    IF ElderlyPerson.likesReading == TRUE:
    suggestBookRecommendations()  // Suggest books based on previous interests

    IF ElderlyPerson.prefersMorningExercise == TRUE:
    scheduleMorningWalk()  // Recommend morning walk at 8 AM

    // Update AI model to adjust for personalized care
    updateAIModelWithInteractionData(interactionData)

    WAIT(12 hours)  // Learn periodically
END WHILE

// Function to update the AI model with new preferences
FUNCTION updateAIModelWithInteractionData(data):
    model.train(data)  // Retrain the personalized model with updated interaction data
```



Driving:

```
// Autonomous Vehicle Operation
IF ElderlyPerson.needsTransport() == TRUE:
    destination = getDestinationFromElderlyPerson()  // Ask for location (e.g., doctor's office, shopping mall)
    route = calculateRoute(destination)  // Use map APIs to calculate the best route

    // Ensure vehicle operates legally and safely
    IF isLegalToDrive(route) == TRUE:
    startAutonomousVehicle(route)  // Start autonomous vehicle with the chosen route

    ELSE:
    alert("Unable to travel due to legal restrictions. Please choose another destination.")
    END IF

// Function to ensure legal and safe vehicle operation
FUNCTION isLegalToDrive(route):
    IF route.containsSchoolZone() OR route.containsRedLightCamera() OR route.hasSpeedLimitViolation():
    RETURN FALSE  // Avoid routes that break the law or have potential traffic violations
    ELSE:
    RETURN TRUE
    END IF
```

Possible Questions?

- Is A.I. ever going to be able to completely mimic human companionship?
- Will A.I. having all of this data only add to our lack of privacy?
- How will the A.I. handle ethical questions?
- Who is liable if the A.I. gives a suggestion that leads to harm or death of the purchaser?

Citations:

https://www.sensi.ai/product/#compassion
https://elliq.com/
https://www.mobihealthnews.com/27024/intel-ges-care-innovations-gets-510k-for-quietcare