



## 2023 Women in AI Canada Hackathon Challenge

WAI Canada Hackathon is a virtual collaboration event between **November 07** and **December 08, 2023**, with the final event happening on **December 08, 2023**. We invite diverse talents and teams to harness the power of AI in crafting solutions that address social issues or market gaps, in line with the World Economic Forum's vision for the [Fourth Industrial Revolution for the Earth](#) or [commitment to Diversity, Equity, and Inclusion \(DEI\)](#). Teams can choose to develop a conceptual program, product prototype, or business model.

### Theme:

The theme of the hackathon is "AI for Good: Building a Sustainable and Inclusive Future". We challenge you to use AI to tackle some of the most pressing problems facing humanity and the planet, such as climate change, poverty, health, education, gender equality, and social justice. You will have the opportunity to learn from experts, mentors, and peers, as well as showcase your innovative ideas to a panel of judges and potential investors. Join us in this exciting journey of creating positive impact with AI!

### How to participate?

- The Call for Abstract Submission is open till November 24, 2023.
- You are required to submit your application, with the details of your group of size 1-3, along with the abstract of the problem and solution you are submitting.
- Your solution should be plagiarism free and also adhere to the theme of this years Challenge - World Economic Forum's vision for the [Fourth Industrial Revolution for the Earth](#) or [commitment to Diversity, Equity, and Inclusion \(DEI\)](#)
- Submitting an abstract is optional at the time of registration, but it must be submitted by November 24, 2023.
- If we require you to change your problem or solution, we will contact you via email before the Challenge opens formally on November 08, 2023.
- You will be paired with a mentor, to help you guide throughout the development of your proposed solution





- The Challenge period will be from November 08 to December 08, 2023, during which you will attend weekly mentoring sessions and relevant technical workshops.
- On December 08, 2023, there will be a final Hackathon Ceremony where you will submit and present your use case and solutions to the Jury Members

### **The solution will be evaluated based on the following:**

- Addressing a relevant problem that is impactful
- Innovation
- AI Element
- Responsible AI
- Feasibility of execution and scalability
- Must be plagiarism-free

### **Read the [Terms and Conditions](#)**

## **Sample Ways to Prepare a UseCase for the Hackathon Challenge**

### **1. AI-Powered Emergency Response for Elderly:**

#### **Problem Statement:**

Elderly residents who live independently face a heightened vulnerability to emergencies, often lacking immediate support. This absence of prompt assistance not only compromises their immediate safety but can also have long-term health repercussions, highlighting an urgent need for proactive solutions in elderly care.

**Potential Datasets:** [PhysioNet](#)

**Potential Solutions:**





### **Approach #1 (Traditional AI):**

**Solution:** Comprehensive Mobile App for Behavioral Anomaly Detection and Assistance.

**Description:** Develop a mobile app that pairs with wearable devices and home sensors to continuously monitor the routines and activities of elderly individuals. The app would notify emergency contacts or services when it detects anomalies that might indicate falls, extended inactivity, or other potential emergencies.

#### **Technical Aspects:**

The mobile application is fortified with intricate algorithms capable of identifying anomalies, allowing it to discern irregular patterns that may suggest potential distress situations for the elderly. It goes a step further by classifying these disturbances into specific types of emergencies, ensuring more targeted and effective responses. A paramount feature of this app is its integration of geolocation services, which, in moments of urgency, swiftly pinpoints the exact whereabouts of the elderly individual, ensuring timely and precise assistance.

### **Approach #2 (Generative AI):**

**Solution:** Virtual Reality (VR) Scenario Generator for Caregiver Training.

**Description:** Use a VR setup to immerse caregivers in various emergency scenarios generated by AI. These realistic training modules can prepare caregivers to handle real-life emergencies more effectively..

#### **Technical Aspects:**

Leverage the power of Virtual Reality (VR) and generative AI to create the Scenario Generator, a platform that realistically simulates a myriad of emergency situations, immersing caregivers in lifelike training environments. Enhance this experience with haptic feedback in VR controllers, offering tactile sensations synonymous with real emergencies, be it sensing a pulse or the exertion of CPR. To maximize the efficacy of training, incorporate a dynamic feedback mechanism, prompting caregivers to adapt and align their responses with proven best practices in emergency care.



## 2. Generative Travel Itineraries for People with Disabilities:

### Problem Statement:

Individuals with disabilities frequently encounter hurdles when seeking travel arrangements tailored to their unique requirements. This oversight in the travel sector has resulted in a noticeable inclusivity gap, underscoring the pressing need for more considerate and adaptive travel solutions.

**Potential Datasets:** [OpenStreetMap](#) , [Google Cloud - Places API](#)

### Potential Solutions:

#### Approach #1 (Traditional AI):

**Solution:** Comprehensive Accessibility Rating and Review Platform.

**Description:** The Comprehensive Accessibility Rating and Review Platform harnesses AI to evaluate and rank travel destinations based on their accessibility. Using aggregated data, it ensures individuals with disabilities find suitable travel experiences tailored to their needs.

#### Technical Aspects:

Develop the Comprehensive Accessibility Rating and Review Platform, a sophisticated AI solution designed to distill and categorize accessibility-related insights from an array of textual reviews and feedback. This platform should offer personalized travel suggestions, ensuring a more tailored experience for those with disabilities. To further enhance user experience and decision-making, integrate geolocation and mapping APIs, enabling the creation of dynamic and interactive accessibility maps for prospective destinations.

#### Approach #2 (Generative AI):

**Solution:** Adaptive Itinerary Generator Tailored for Accessibility.





**Description:** The Adaptive Itinerary Generator leverages generative AI to craft unique travel plans precisely tailored for specific disabilities. By processing user inputs, it creates bespoke travel experiences, revolutionizing inclusive travel planning.

**Technical Aspects:**

Participants are tasked to devise the Adaptive Itinerary Generator, a system that exploits the capabilities of generative AI, simulating travel scenarios to output distinct itineraries tailored for specific disabilities. It should actively refine and enhance itinerary proposals by analyzing user feedback. Furthermore, to ensure the most current and relevant information is relayed to users, integrate with local transportation and venue service APIs, ensuring real-time updates and alternative options are dynamically incorporated into the user's itinerary.

### 3. Agriculture: Sustainable Farming

**Problem Statement:**

In the realm of agriculture, farmers grapple with the dual challenge of maximizing crop yields while preserving the integrity of their soil. Yet, many still rely on labor-intensive, manual methods to monitor soil health or enlist costly experts for assessments, making the pursuit of sustainable farming both expensive and time-consuming.

**Potential Datasets:**

- Datasets on soil health and crop yields here: [Kaggle Datasets](#)
- They offer statistical databases that include soil and crop information: [Food and Agriculture Organization of the United Nations](#)
- Provides datasets related to agriculture, including soil data: <https://data.nal.usda.gov/>

**Potential Solutions:**

**Approach #1 (Traditional AI):**

**Solution:** Soil Health Monitoring System.





**Description:** The Soil Health Monitoring System is a pioneering AI-powered solution designed for the modern farmer. It seamlessly merges technology with agriculture, providing a robust tool that offers precise analyses of soil samples. By determining the nutrient composition of the soil, it goes beyond mere data presentation, offering strategic recommendations tailored to ensure optimal fertilization. With this system, farmers can make informed decisions, optimizing crop yields while preserving the long-term health and vitality of their soil. It's a harmonious blend of tradition and technology, aiming to revolutionize sustainable farming.

Analyze soil samples for nutrient content and advise on fertilization.

**Technical Aspects:**

The core of the Soil Health Monitoring System is its advanced AI models tailored for soil sample analysis. These models should accurately discern nutrient content in the soil, translating complex data into actionable insights for farmers. By offering precise fertilization recommendations, the system ensures both enhanced crop yield and sustained soil health, representing a harmonious blend of traditional farming wisdom with modern technological innovation.

**Approach #2 (Generative AI):**

**Solution:** AI-driven Crop Rotation Planner for Sustainable Yields and Soil Health.

**Description:** The Crop Rotation Planner, powered by generative AI, intelligently crafts crop rotation strategies tailored to preserve and enhance soil vitality. By determining the best sequence of crops, it addresses both immediate yield goals and long-term soil health, offering farmers a sustainable path forward.

**Technical Aspects:**

Participants are encouraged to develop a generative AI model, firmly anchored in thorough soil health and crop yield data. The model should be adept at learning and forecasting the best crop sequences as seasons progress. It's imperative that this AI solution remains adaptive, refining its rotation strategies in tandem



with evolving agricultural conditions. Always keep in mind the core objective: a harmonious balance between long-term soil vitality and sustained crop productivity. Your innovation should champion both these critical facets.

#### **4. AI-Driven Public Transport Assistance:**

##### **Problem Statement:**

The public transport system, marred by overcrowding and operational inefficiencies, often presents daunting accessibility hurdles. Such challenges become even more pronounced for individuals with disabilities, making their commute not just inconvenient, but at times, nearly impossible.

**Potential Datasets:** Public datasets from city transport departments, [Moovit Public Transit Index](#)

##### **Potential Solutions:**

##### **Approach #1 (Traditional AI):**

**Solution:** Predictive Crowd Management System.

**Description:** The Predictive Crowd Management System stands as a beacon of innovative transit solutions in bustling urban landscapes. By harnessing the power of AI, this system can foresee peak crowd times and predict congestion patterns. By doing so, it offers commuters, especially those with disabilities, the option to travel during less crowded times or use alternative routes, ensuring a safer and more comfortable journey.

**Technical Aspects:** Participants are urged to harness sophisticated forecasting methodologies that meticulously analyze past and current transit data to predict future congestion trends. Additionally, your system should integrate advanced routing algorithms, designed to pinpoint and recommend the most efficient pathways, ensuring that the recommendations consider both time and crowd density. In essence, your solution should seamlessly meld predictive analytics with real-time route optimization to offer a robust and user-friendly experience for commuters.



## Approach #2 (Generative AI):

**Solution:** Generative Route Planner.

**Description:** The Generative Route Planner endeavors to redefine public transportation planning by leveraging the power of generative AI. Instead of merely adjusting to existing transit pathways, it crafts entirely novel routes or schedules tailored for optimal accessibility and minimized congestion. By generating these innovative solutions, the system looks to reshape the commuter experience, placing a premium on both efficiency and inclusivity.

**Technical Aspects:** Participants are encouraged to devise models that not only analyze traditional transport data but also envision and simulate entirely new transportation scenarios. Your generative AI should be capable of conceptualizing innovative route structures, potentially introducing routes or timings that have never been considered. The objective is to generate fresh solutions, reshaping public transport dynamics to prioritize accessibility and reduce crowding, all while maintaining operational feasibility.

## 5. Urban Planning: Smart Cities

### Problem Statement:

Modern urban landscapes confront pivotal challenges in traffic coordination, waste management, and energy efficiency. Existing solutions heavily lean on high-cost infrastructures that not only require significant investments but also demand intensive maintenance, adding layers of complexity to city management.

**Potential Datasets:** [Kaggle Datasets](#) , [OpenStreetMap](#) , [Data.gov](#)

### Potential Solutions:

#### Approach #1 (Traditional AI):

**Solution:** Traffic Flow Optimizer.







**Description:** The Traffic Flow Optimizer seamlessly integrates traditional AI methods with the bustling dynamics of urban transportation. Acting as the intelligent nerve center for traffic management, it meticulously analyzes real-time traffic data. With the primary aim of alleviating congestion, the system adjusts traffic signals dynamically, orchestrating a smoother flow of vehicles and ensuring that roads are used to their maximum potential without gridlocks.

**Technical Aspects:** Participants should focus on crafting models that efficiently process real-time traffic data, looking for patterns and potential bottlenecks. The crux of this challenge lies in optimizing traffic signal timings dynamically. Your solution should strive to determine the optimal duration and sequence of traffic signals across intersections, ensuring that they adapt swiftly to changing traffic conditions, thereby ensuring reduced congestion and smoother vehicular movement.

## Approach #2 (Generative AI):

**Solution:** Urban Layout Generator.

**Description:** The Urban Layout Generator is an avant-garde fusion of generative AI and urban planning. Envisioning the cities of tomorrow, this tool crafts potential city layouts that strike a harmonious balance between bustling avenues, serene green spaces, and essential amenities. Its designs are not only aesthetically pleasing but are also meticulously optimized for traffic flow, ensuring that the city's pulse remains vibrant yet uncongested.

**Technical Aspects:** Participants are entrusted with the task of harnessing urban design principles combined with intricate traffic data. The primary challenge is to synthesize this knowledge into a generative model capable of producing city layouts that are both functional and sustainable. Your model should consider the intricacies of modern urban design, including pedestrian pathways, vehicular routes, and the strategic placement of green spaces and amenities, ensuring an efficient and lively urban ecosystem.



For any questions email us at : [hackathon-canada@womeninai.co](mailto:hackathon-canada@womeninai.co)