PIT Philadelphia Smart City

A project in collaboration with AWS and Shyam Sundar, Director, Center for Responsible Ai

Fall 2022

Penn State

Nittany Ai Alliance

AI Advance Project Charter

Key Project Details

Project Name	PIT SEPTA Philadelphia Smart City
Partner Organization	PIT, SEPTA, AWS and the Center for Responsible AI
Target Semester	Fall 2022
Project Type	Proof-of-Concept
AI Discipline	ML and CV
Proof-of-Concept Owner(s)	Shyam Sundar and SEPTA
AI Alliance Director	Daren Coudriet (daren@psu.edu)
AI Advance Program Manager	Tim Hijazi (hjh5529@psu.edu)
Data Manager	TBD
Subject Matter Expert(s)	Shyam Sundar AWS - TBD SEPTA - TBD
AI Associate(s)	Poorvika Vijayanand, Thomas Folz, Sai Karthik

Project Summary

The City of Philadelphia is currently in an innovation phase, expanding partnerships and using technology to solve real world problems facing our city. Their partnership with the Nittany AI Alliance started in the summer of 2020. Building on the amazing experience of the previous project, the City is partnering with the Nittany AI Alliance for this new project in collaboration with SEPTA and other industry partners, while also helping to identify a broader set of projects that will support the implementation of the SmartCityPHL Roadmap. This partnership also helps support advancing their progress towards the United Nations' Sustainable Development Goals (SDGs) and in deploying digital technology and data effectively – the City of Philadelphia has been recognized as one of 20 cities globally by ESI ThoughtLab that are leading in this space.

The focus of this project will be on helping the Southeastern Pennsylvania Transportation Authority SEPTA Safety Officers identify areas where their help may be needed in. The project will leverage data captured via CCTV cameras in the subway system platforms and subway cars to identify circumstances that warrant their intervention.

Problem Statement

The safety of Philadelphia subway system has been called to light, resulting in a negative impact on the ridership and safety reputation. The City of Philadelphia and SEPTA would like to explore the use of AI/ML systems to detect areas of concern with the objective of increasing safety.

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Project Objectives

The primary objective of this project is:

1) To use computer vision to automate the identification of circumstances that require the attention of a safety officers at the City of Philadelphia subway system.

Project Scope

The following define the project scope:

1) Analysis of CCTV data to determine specific conditions, e.g., an overcrowded subway platform

2) Determine computer vision technology and approach to analyzing the provided data

3) Training a model to identify the conditions as specified

Project Deliverables

The following are the general deliverables for this project, to be confirmed with the PoC Owner:

1. Project wiki – students will update the wiki each week, so the client has a complete record of project artifacts at its conclusion.
2. Project GitHub repository – students will store any code resulting from the project for client access.
3. Sprint meeting minutes – students will conduct sprint review meetings to discuss the results and provide documented meeting minutes for each meeting.
4. Proof-of-Concept results – students will strive to create an enhanced proof-of-concept based on the client's feedback provided at each of the bi-weekly sprint meetings.

Project Metrics for success

The following are shared metrics for success for this project:

1. Students reporting growth in one or more of the following core competency areas: multicultural awareness, systems thinking, ethical reasoning, civic responsibility, and professional development.
2. Students identified, validated, and tested existing AI/ML technologies that may be leveraged to enhance safety in the Philadelphia subway system.

Project Data Strategy

The data for this project will gathered from SEPTA with the assistance of the Faculty and Industry partners.

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Project Resources & Funding

The AI Alliance will be utilizing three paid part-time students for a duration of approximately 14 weeks during the 2022 Fall semester. The students will be recruited and hired by Penn State as wage payroll employees. The AI Alliance will be responsible for management, time tracking and compensation for all students. The students will start the project on August 25th and will complete the project on December 9th.

Roles & Responsibilities

Strategic Leads: Shyam Sundar and TBD – AWS + SEPTA Partners
> Primary strategic leaders. Provide vision and oversight. Determine direction, evaluate options, and drive the project forward.

Proof-of-Concept Owner: SEPTA - TBD
> Primary client contact and decisionmaker. Attends and provides feedback at sprint review sessions. Facilitates connections with subject matter experts and data managers.

AI Advance Project Leader/Scrum Master: Rebecca An
> Primary AI Advance contacts. Project manager responsible for Associate activity and project progress. Facilitates sprint review sessions, workshops, and demonstrations. Accountable for project delivery.

Subject Matter Expert(s): TBD
> Essential client contact. Attends and provides feedback at sprint review sessions related to their area of expertise. Relied upon for insight into validity of features and business process refinement.

Data Manager(s): TBD
> Essential client contact. Facilitates access to required data sources. Provides data in required formats with any necessary adjustments and/or redactions to ensure project completion.

AI Associate(s): Poorvika Vijayanand, Thomas Folz, Sai Karthik
> Nittany AI Advance team members specializing in Data Science, Machine Learning Natural Language Processing and Computer Vision Systems. Collaborate with each other and Project Manager to accomplish goals on time and to-spec.

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Timeline & Key Dates

Our project strategy aims to ramp-up and ensure all parties are on the same page regarding goals, potential needs and checkpoints throughout the project, and necessary roles to be played by project team members.

During the project, we focus on a 14-week period within the Spring semester, ensuring maximal investment from the team and minimal intersections with significant academic milestones, such as delivery of term projects or final exam preparation. Some key dates are outlined below.

Launch Meeting: The launch meeting is designed to introduce the team to the client, discuss the problem being presented, the project objectives, scope and deliverables. The team can begin doing some homework prior to the Design Workshop.

      Proposed Date: **Friday September 1st, 2022**

Design Workshop: The Design Workshop gets into the details of the project with the student team and solidifies a prioritized list of features/functions for the PoC. At this workshop assumptions are confirmed, and a feature backlog is generated for the team to pursue. The features are prioritized, and the team assigns levels of complexity to each item, which helps drive timeline estimates.

      Proposed Date: **September 15th, 2022**

PoC Sprint Meetings: The team works from a prioritized list of features/functions that have been pre-determined and agreed upon during the Design Workshop meeting. The results of each sprint are reviewed at the start of each sprint meeting. The client participates in each meeting, providing feedback and direction to help guide the team in the next sprint meeting. It is understood as new information is uncovered, the team's direction and work effort may be redirected.

Mid-Project Review: At approximately mid-semester, there is a project review with the client. This review is designed to reflect on the project experience thus far. This discussion is aimed at deciding on engagements for the following semester, if appropriate. We scheduled this early enough such that the students have yet to finalize their plans for the upcoming semester should recruitment for separate internships be a priority.

      Proposed Dates: **TBD, Target = Week of November 7th, 2022**

Project Wrap Up Meeting: The team presents their deliverables and summarizes the approaches and progress throughout the project: what worked (or didn't), and why. What was learned and what are some potential next steps, if any, for advancing the PoC.

Proposed Date: **TBD, Target = Week of December 5th, 2022**

Client Meeting Retrospective: Discussions at varying levels of resolution that focus on the project experience after its conclusion. What went well? What are your takeaways? What can we do better?

Proposed Date(s): **TBD, Target = Week of December 12th, 2022**

Signatures

Proof-of-Concept Owner

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Name:
Title:
Date:

Nittany AI Advance Program Manager

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Name: Tim Hijazi
Title: Nittany AI Advance Program Manager
Date: