Introduction

Software is a critical part of the Purple Crow Lidar's workflow. Once data is collected, it is not useful until it is processed by a data analysis program. The group currently uses Picon, a piece of software developed by Paul Doucet in 2009 as part of his MSc thesis. However, Picon no longer meets the needs of the group; so new software, Pecon, is being developed. A comparison of Picon and Pecon can be seen in Figure 1.

Pecon Design

Pecon is designed using an object-oriented approach. After a number of revisions a class diagram representing the system was developed. This class diagram only represents the data, not the graphical user interface. During the implementation the design was slightly modified and the changes were noted in the diagram. The current class diagram is shown in Figure 2.

Why Object Oriented?

An Object Oriented approach was chosen over a functional approach for a number of reasons.

1. Object Oriented Programming (OOP) simplifies working with large code-bases by keeping similar ideas together.
2. OOP is easy to reuse through inheritance
3. Polymorphism allows different classes to define the same function and the correct one will be used at runtime.

What is MVC?

Model-View-Controller (MVC) is a common software architecture pattern. It describes a way to develop software more resilient to change. MVC defines three types of classes and only allows them to interact in well-defined manners.

Model: The data-set the user is currently using.

View: The graphical user interface, updates when a change in the model occurs.

Controller: The user interacts with the controller to modify the model.

Pecon was developed using this methodology. Since a graphical user interface has not been written, only model classes have been defined.

What's a Class Diagram?

A class diagram represents the different relationships between different classes in a program. Each type of relationship has its own type of connector:

- An Association line. The classes need to reference each other to work.
- A Composition line. The classes are part of a “whole-part” relationship. For example, a Lidar System is composed of some number of Channels.
- A Inheritance or Generalization line. The classes are in a “type of” relationship. For example, CRL is a type of Lidar System.

Future Work

The next steps for Pecon include:
1. Complete the manual.
2. Implementing code written by former graduate students for their theses.
3. Create a Graphical User Interface for common usage.

PCL on the Web

@purplecrowlidar
facebook.com/purplecrowlidar
purplecrowlidar.tumblr.com/
blog.purplecrowlidar.ca/

We gratefully acknowledge the financial and logistical support provided by:

CANDAC
Western