**CSE 3063 LAB**

**Finding Coupling and Cohesion in Class Diagram**

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To minimize the given classes and achieve maximum cohesion and minimal coupling, the classes can be organized as follows:

**Class 1: CommunicationModule**

1. **Data Types:**
   1. Transmitter
   2. Receiver
   3. Signals
   4. Power
2. **Methods:**
3. SendData
4. ReceiveData
5. EstablishConnection
6. **Coupling:**
   1. **Class Coupling:** CommunicationModule is responsible for handling communication and relies on Transmitter, Receiver, Signals, and Power.
   2. **Data Coupling:** Methods in CommunicationModule operate on separate data types but share common purpose.
7. **Cohesion:**
8. **Functional Cohesion:** Methods are related by their involvement in communication operations.

**Class 2: MotionController**

1. **Data Types:**
   1. Direction
   2. Distance
2. **Methods:**
   1. Start
   2. Stop
   3. Move
   4. Turn
3. **Coupling:**
4. **Class Coupling**: MotionController handles motion-related tasks and relies on Direction and Distance data types.
5. **Cohesion:**
6. **Functional Cohesion**: Methods are related to motion control operations.

**Class 3: SensorModule**

1. **Data Types:**
   1. UltrasonicArray
   2. CameraArray
2. **Methods:**
   1. FrontDetection
   2. BackDetection
   3. ObstaclePresent
3. **Coupling:**
4. **Class Coupling:** SensorModule handles sensor-related tasks and relies on UltrasonicArray and CameraArray data types.
5. **Cohesion:**
6. **Functional Cohesion:** Methods are related to sensor operations.

**Class 4: PositioningModule**

1. **Data Types:**
   1. Latitude
   2. Longitude
   3. Altitude
2. **Methods:**
   1. SendLocation
   2. ReceiveLocation
3. **Coupling:**
   1. **Class Coupling:** PositioningModule deals with positioning data and relies on Latitude, Longitude, and Altitude.
4. **Cohesion:**
   1. **Functional Cohesion:** Methods are related to positioning operations.

**Class 5: AnalysisModule**

1. **Data Types:**
   1. Minerals
   2. Ores
   3. Water
   4. Others
   5. TargetElements
   6. OtherElements
   7. SpaceDebris
   8. ForeignElements
2. **Methods:**
   1. DetectMineral
   2. DetectOre
   3. DetectWater
   4. DetectOthers
   5. PerformAnalysis
   6. ListContent
   7. CreateReport
3. **Coupling:**
   1. **Class Coupling:** AnalysisModule is responsible for analysis tasks and relies on various data types for analysis.
   2. **Data Coupling**: Methods in AnalysisModule operate on separate data types but share common purpose.
4. **Cohesion:**
   1. **Functional Cohesion:** Methods are related to analysis operations.