

```

graph TD
    Start(( )) --> Idle
    Idle -- "Connect Robot" --> Conn{ }
    Conn -- "Connection Success" --> Initial
    Conn -- "Connection Failure" --> Idle
    Initial -- "Wait for instruction Auto/Manual" --> Initial
    Initial -- "Choose Manual Mode" --> Manual
    Initial -- "Choose Auto Mode" --> Auto
    Manual -- "Manual Control" --> Manual
    Manual -- "Direction Key Pressed" --> Move
    Move -- "Direction Key Pressed" --> Move
    Move -- "Choose Manual Mode" --> Stop
    Stop -- "Wait For instruction" --> Stop
    Stop -- "Save point To XML" --> Manual
    Stop -- "Detected Wall" --> Stop
    Stop -- "Choose Manual Mode" --> Stop
    Stop -- "If [AutoMode == true] Change to Auto" --> Auto
    Stop -- "If [Manual == true] Change to Manual" --> Manual
    Auto -- "Explorer the map" --> Auto
    Auto -- "Press Start Button" --> AutoExplorer
    AutoExplorer -- "Auto Explorer" --> AutoExplorer
    AutoExplorer -- "Wall Detected" --> DetectionState
    AutoExplorer -- "If Map Explorer Completed" --> Stop
    AutoExplorer -- "if [Right == true] && [Left == true] Back to Auto Explorer" --> AutoExplorer
    DetectionState -- "No More Wall Detected, Back to Original Detected Point, set [ Right = true ]" --> RightWallDetection
    DetectionState -- "Move Right to Continue Detect Wall" --> RightWallDetection
    DetectionState -- "Back to detection" --> RightWallDetection
    DetectionState -- "Save Point" --> SaveXML
    RightWallDetection -- "Back to detection" --> RightWallDetection
    RightWallDetection -- "Save Point" --> SaveXML
    SaveXML -- "Back to detection" --> RightWallDetection
    SaveXML -- "Save Point" --> LeftWallDetection
    LeftWallDetection -- "Back to detection" --> LeftWallDetection
    LeftWallDetection -- "Save Point" --> SaveXML
    LeftWallDetection -- "If [Right == true], Move Left to Continue Detected" --> DetectionState
    LeftWallDetection -- "Left Detected Complete, set [Left = true]" --> Stop
    Stop -- "If Map Explorer Completed, produce sound 'beep'" --> EndState
    Stop -- "Chose Manual Mode set [Manual = true]" --> Manual
  
```

Robot state

Idle

Initial

Manual

Auto

Move

Stop

Detection State

Right Wall Detection

Left Wall Detection

Save XML

End State

Connect Robot

Connection Success

Connection Failure

Wait for instruction Auto/Manual

Choose Manual Mode

Choose Auto Mode

Manual Control

Direction Key Pressed

Detected Wall

Choose Manual Mode

Wait For instruction

Save point To XML

If [AutoMode == true] Change to Auto

If [Manual == true] Change to Manual

Explorer the map

Press Start Button

Auto Explorer

Wall Detected

If Map Explorer Completed

if [Right == true] && [Left == true] Back to Auto Explorer

No More Wall Detected, Back to Original Detected Point, set [Right = true]

Move Right to Continue Detect Wall

Back to detection

Save Point

If [Right == true], Move Left to Continue Detected

Left Detected Complete, set [Left = true]

If Map Explorer Completed, produce sound "beep"

Chose Manual Mode set [Manual = true]

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