MC-AR-Sandbox Manual

A real-time Minecraft terrain visualizer for augmented reality sandboxes using Xbox Kinect

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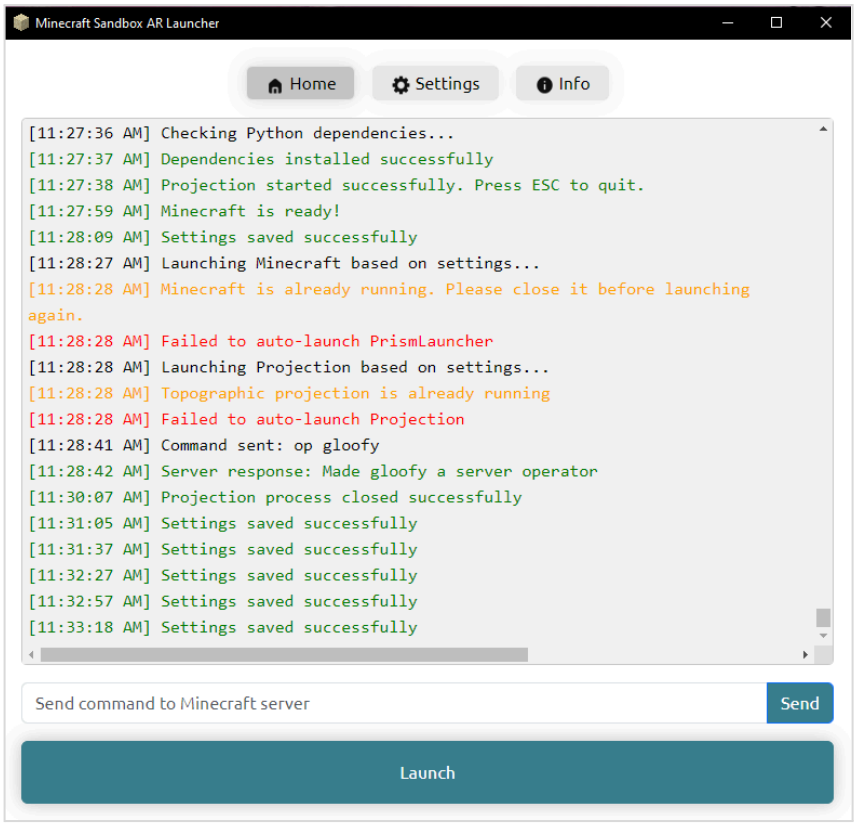
Mc-ar-launcher

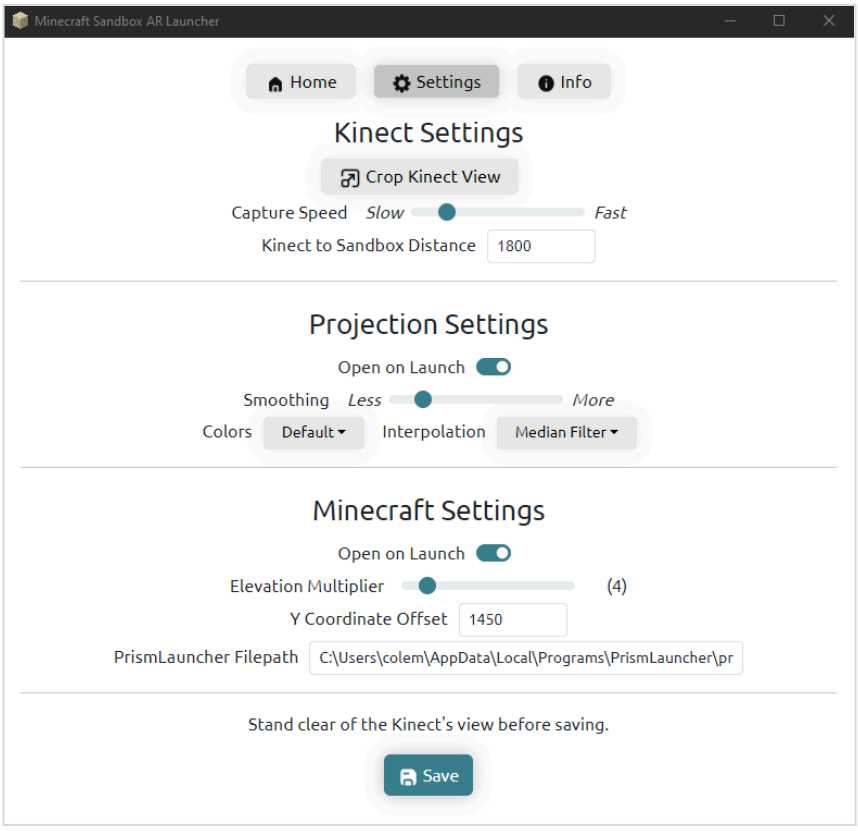


Home Page

On this page you can view the logs produced by mc-ar-launcher.
Green is a success response
Orange is a warning
Red is a failure, but not necessarily critical

You can also send a command to the minecraft server, such as
“op <username>”, to make a player a server operator.

The behavior of the Launch button depends on the toggles you have enabled on the settings page.



Settings Page

On this page you can adjust the settings to be tuned to your environment. All of the changes made to the settings will be immediately updated in Minecraft or in the topographic projection when saved.

You can hover over each setting in the launcher for a brief description on what it changes/does.

You can also crop the view of the Kinect to only use data that is within the bounds of your sandbox.

Info Page

On this page there are longer descriptions of what each Menu / Gamemode entails.

In the launcher, click on the dropdown icon to expand the container to read the descriptions.

For more information visit github.com/colemaring/MC-AR-Sandbox.
Or email me at colemaring@gmail.com

Minecraft GUIs

Hotbar:

Compass: Biome Menu
Nether Star: Gamemode Menu

Biome Menu:

- Choose between 7 biomes to visualize the terrain as.
- The bucket is used to toggle water (or lava) depending on which biome you have selected. Note that some biomes do not allow water.
- The top right item is used to perform a hard reset on the terrain. This operation takes a few seconds and should only be used in the event of a bug or manual terrain modifications you'd like to reset.

Gamemode Menu:

- Choose between 5 gamemodes.
- The redstone block in the bottom middle will stop the current gamemode if one is currently running.
- Starting a new gamemode while one is running will cancel the current and start the new one.
- Hover over the different gamemode options in Minecraft for a brief description of what it entails.

First Time Setup/Tuning

Mc-ar-launcher Installation

- Download Python 3.12 from the Microsoft Store, PrismLauncher, Kinect SDK, and Java 21+.
- Log into PrismLauncher with your Microsoft/Minecraft account.
- Download the latest MC-AR Launcher release. (First-Time setup takes about 5 minutes)
- Once you see “Minecraft server is ready!” in the logs, Enter “op <yourmcusername>” and send.
- In Minecraft, navigate to Options > Video Settings > Chunk Builder, and switch to Fully Blocking.

Hardware Setup

- Connect a Kinect V2 sensor and projector to your Windows 10/11 PC.

- For optimal projection accuracy, align the Kinect and projector as closely as possible. Both should be as close to perpendicular to the sandbox as possible.

- Configure the projector to be a secondary display by searching for “Rearrange multiple displays” in the windows search bar

Tuning Settings

- **Crop Kinect View** by dragging the four corners to correspond with the corners of your sandbox in the Kinect’s view.
- **Capture Speed** corresponds to how many updates per second are sent to Minecraft. A higher value will provide for the illusion of smoother motion, but it will be more demanding on CPU resources. A middle value is reasonable.
- Kinect to Sandbox Distance should be measured in millimeters. Each Kinect unit has some unknown margin of error, so the value you enter into this box may be + or - 300mm. This value is used to determine at what depth to begin assigning values colors in the topographic projection. You can find the optimal value by binary searching until you’ve found a value where the deepest and highest part of your sandbox are assigned unique and valid colors.
- **Open on Launch (Projection)** controls whether or not the Projection is launched when the launch button is clicked on the home page.
- **Smoothing** is the size of the Median Filter applied on the topographic projection, if you’ve selected the Median Filter. If interpolation is None, smoothing will not be applied. A higher value will result in more smooth topographic levels, but you will lose detail.
- **Colors** controls with color palette to use for the topographic projection. Natural uses the color’s you’d expect for an elevation map, whereas rainbow just uses rainbow colors.
- **Interpolation** controls which type of interpolation to use to smooth the data. Choose from None or Median Filter.
- **Open on Launch (Minecraft)** controls whether or not Minecraft is launched when the launch button is clicked on the home page.

- **Elevation Multiplier** controls how dramatic/sensitive the elevation changes in Minecraft are. (A value of 6 is reasonable). (Higher values are LESS sensitive). Changing this value will result in you needing to re-tune the Y Coordinate Offset.
- **Y Coordinate Offset** is an arbitrary number that corresponds to the offset needed to make the Minecraft terrain display at the correct y coordinate. Binary search on this number until the deepest spot in your sandbox corresponds to y = 2. This value will need to be re-tuned when changing the Elevation Multiplier.
- **PrismLauncher Filepath** points to the PrismLauncher.exe, typically located in C:\Users\<user>\AppData\Local\Programs\PrismLauncher\prismlauncher.exe

Troubleshooting

Ensure Python 2.x.x doesn't not exist on your system.

- The topographic projection is only compatible with Python 3.x.x

Ensure you've op'd yourself, as this is necessary to receive the Compass and Nether Star when joining.

- Relog after you've done this to be given the items
