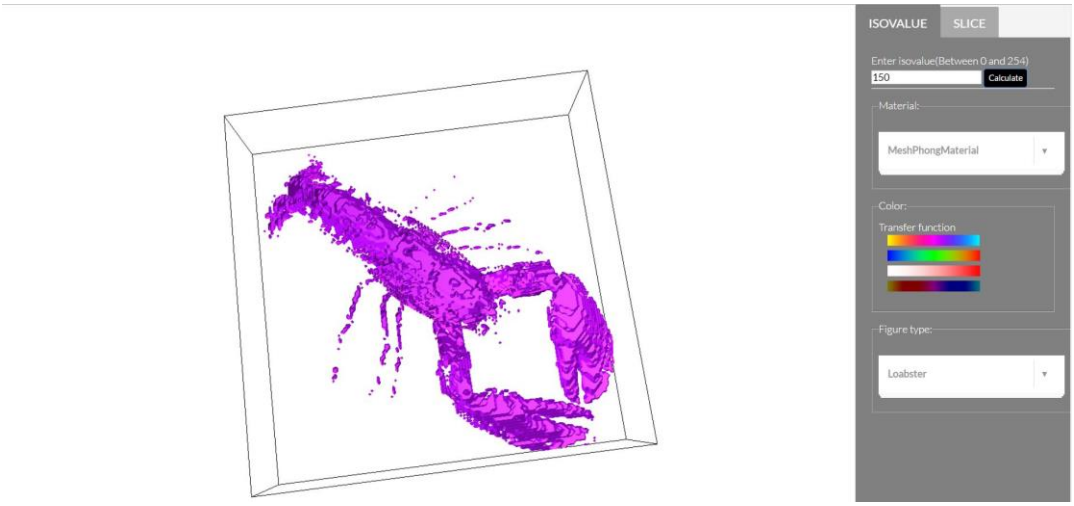
# Final Report

# Information visualization

Done by: Nikhanbayev Nursultan

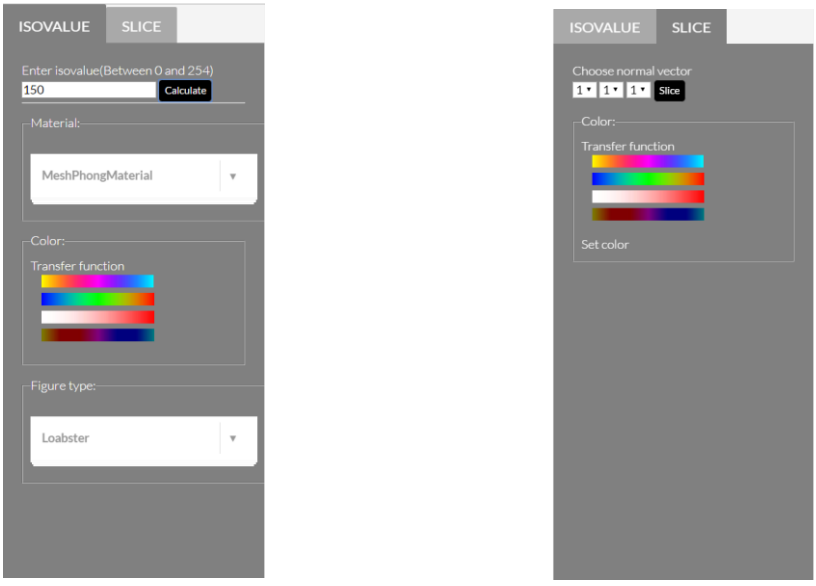
163x028x

My volume visualization application consists of user interface for controlling rendering and rendering screen.




Picture 1. Application

Rendering screen just shows shapes according to settings which was done in controlling part. So user interface is main.




Picture2. User interface

As it is visible on Picture 2 user interface has 2 tabs: for Isovalue calculation and for Slicing.

## Isovalue calculation part

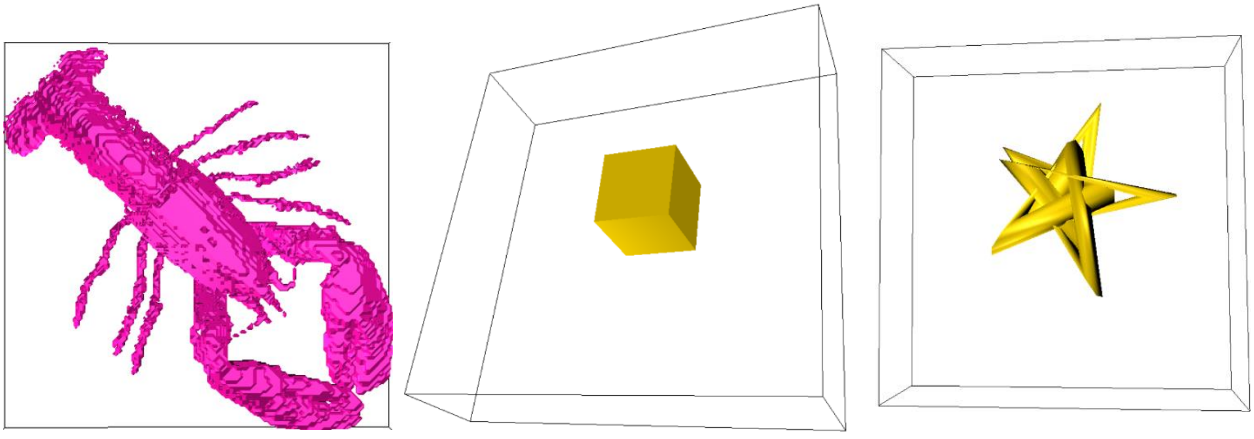
Isovalue tab starts from input for isovalue(which should be between 0 and 254) and Calculate button. If we will push calculate button we will get shape for particular isovalue. It works only with Lobster figure. Default value is 100.

Next is choosing material. I considered only 3 types of materials Basic, Lambert and Phong materials. As default MeshPhongMaterial is used. For Lambert and Phong materials light will automatically added. Choosing material type from select box will automatically update screen.

Transfer function.

4 fixed different transfer functions is present in the application. Current transfer function can be changed by clicking on colorful line which represents transfer function. Transfer function works only with Lobster.

And last one on this tab is Figure type. I added only 3 of them: Lobster, Cube and Star. Star is Torus knot with specific settings. Default one is Lobster.

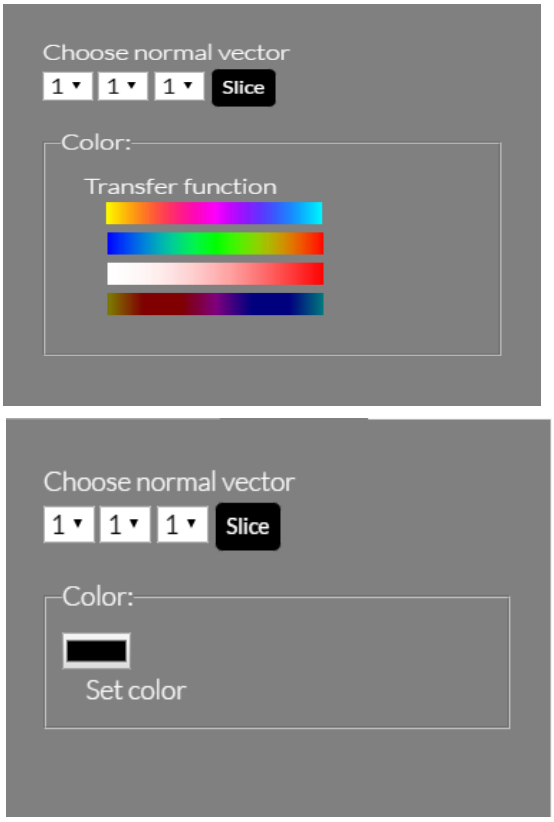


Picture3. Shape types

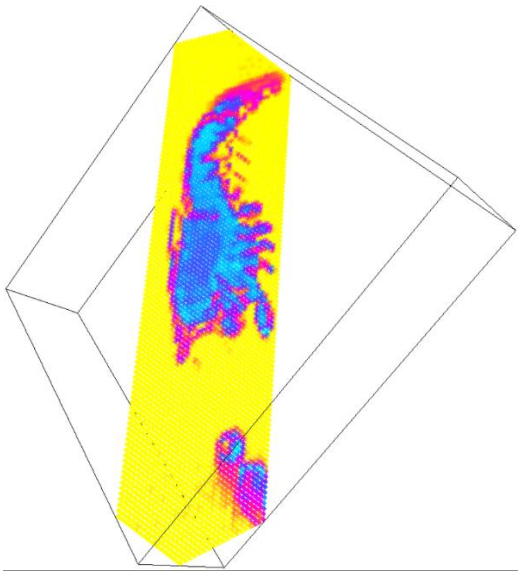
## Slice part

Here we can slice figures. If current figure is Lobster then we will see Transfer function panel, but in case of other 2 we will see input color element (<input type=color>). So Lobster slice is using transfer function, while Cube and Star simple Three.Color.

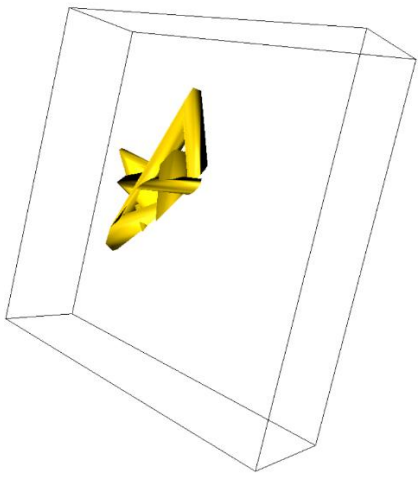
After choosing normal vector (which cannot be (0,0,0)), and pushing slice button we will get slice of figure. Slice works quite different with Lobster and other 2 figures. In case of Lobster we will get plane and in case of Cube and Star sliced 3D object:




Picture 4. Color choosing field

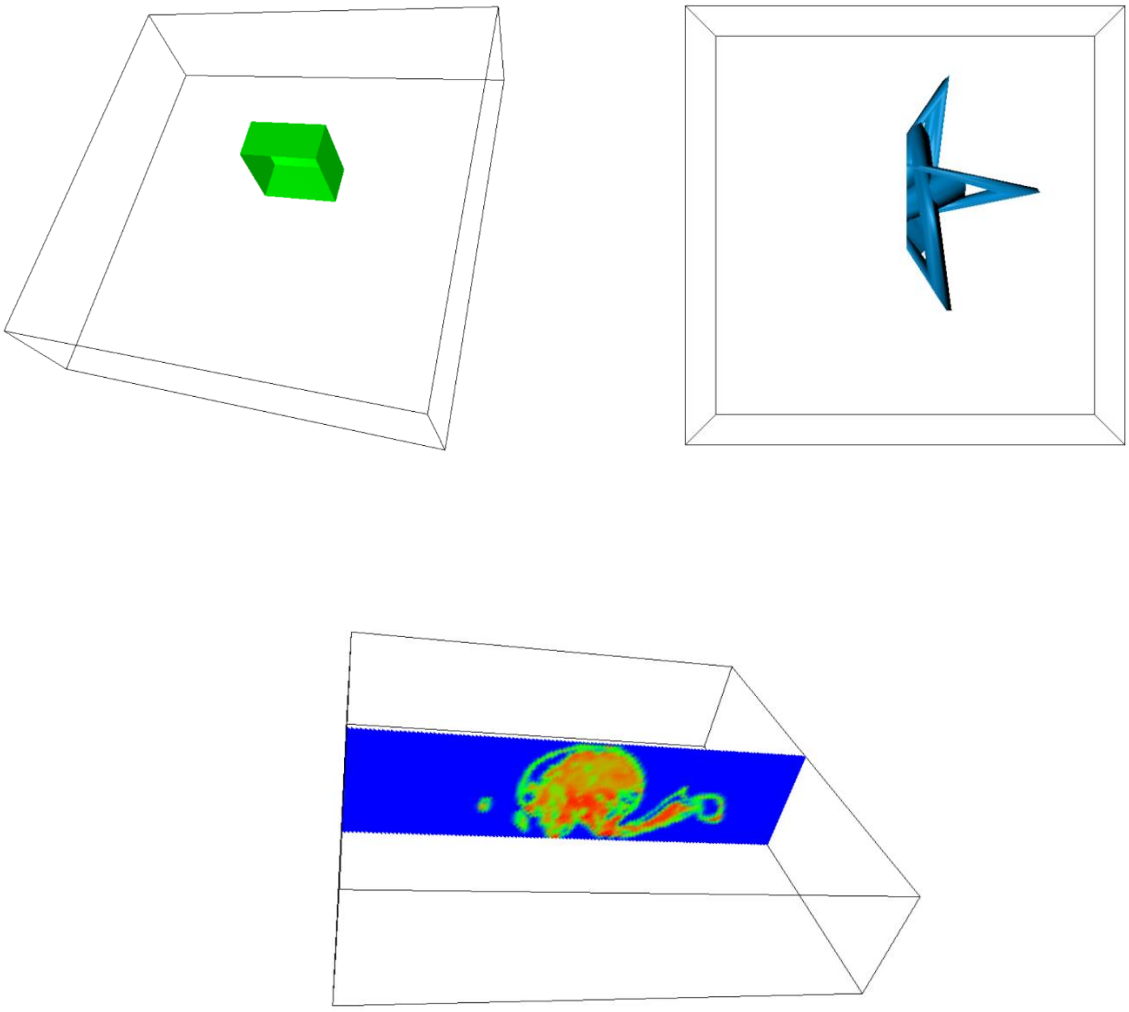


Picture 5. Lobster sliced with normal (1,1,1)



Picture 6. Star sliced with normal(1,1,1)

Slice part do not have material choosing or shape choosing controllers. But we can go to Isovalue tab and use its controllers for shape and material choosing. Pushing buttons of Calculate or Slice will make application to use particular operation (slicing or volume rendering). To change operation need to push opposite button (in case of slicing Calculate button, in case of Volume rendering Slice button), it will change current operation to opposite one.



Picture 7. Example images from application