Gamma matrix for rotations

Euler Rotation with a "correction" for left orientation (I guess. ...)

$$EulerRot(v) := \left\| \begin{array}{l} \Omega1(\alpha) := \begin{bmatrix} 1 & 0 & 0 \\ 0 & \cos(\alpha) & -\sin(\alpha) \\ 0 & \sin(\alpha) & \cos(\alpha) \end{bmatrix} \quad \Omega2(\varphi) := \begin{bmatrix} \cos(\varphi) & 0 & \sin(\varphi) \\ 0 & 1 & 0 \\ -\sin(\varphi) & 0 & \cos(\varphi) \end{bmatrix} \quad \Omega3(\vartheta) := \begin{bmatrix} \cos(\vartheta) & -\sin(\vartheta) & 0 \\ \sin(\vartheta) & \cos(\vartheta) & 0 \\ 0 & 0 & 1 \end{bmatrix} \\ R := \Omega1(v_1) \cdot \Omega2(v_2) \cdot \Omega3(v_3) \\ \overrightarrow{R \cdot \begin{bmatrix} 1 & 1 & -1 \\ 1 & 1 & -1 \\ -1 & -1 & 1 \end{bmatrix}}^{T} \end{array} \right\|$$

Angles from the rotation matrix.

$$EulerRotInv(\gamma) := \left\| \begin{bmatrix} \operatorname{atan}(\gamma_{3\,2}, \gamma_{3\,3}) & \operatorname{atan}\left(-\gamma_{3\,1}, \sqrt{(\gamma_{1\,1})^2 + (\gamma_{2\,1})^2}\right) & -\operatorname{atan}(\gamma_{2\,1}, \gamma_{1\,1}) \end{bmatrix} \right\|$$

Fridel default "point of view" rotation matrix for plot 3D into 2D region plots

$$\gamma := \begin{bmatrix} -0.8232 & -0.4194 & 0.3827 \\ 0.5677 & -0.6187 & 0.543 \\ 0.009 & 0.6643 & 0.7474 \end{bmatrix}$$

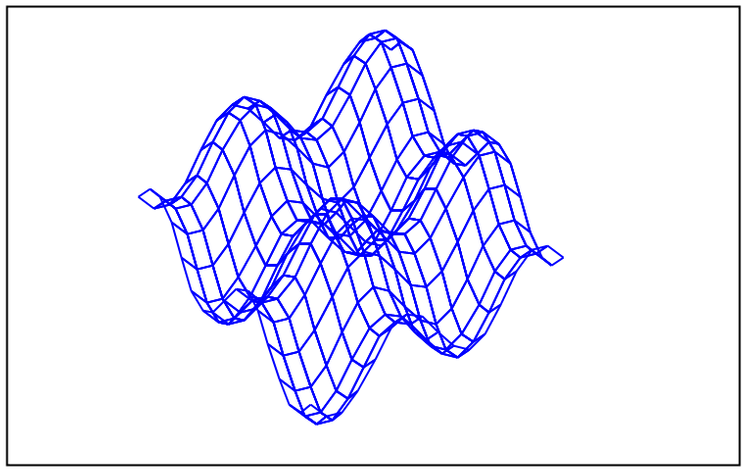
Angles from Fridel usual gamma

$$\Omega := EulerRotInv(\gamma) = \begin{bmatrix} 41.6312 & -0.5157 & -145.4088 \end{bmatrix} °$$

You can change those angles for get some new "point of view" matrix.

$$EulerRot(\Omega) = \begin{bmatrix} -0.8232 & -0.4194 & 0.3827 \\ 0.5677 & -0.6187 & 0.5431 \\ 0.009 & 0.6643 & 0.7474 \end{bmatrix}$$

$$f(u, v) := \begin{bmatrix} u \\ v \\ \sin(2 \cdot u) + \sin(2 \cdot v) \end{bmatrix} \qquad F := \text{CreateMesh}(f, -3, 3, -3, 3, 16, 16)$$

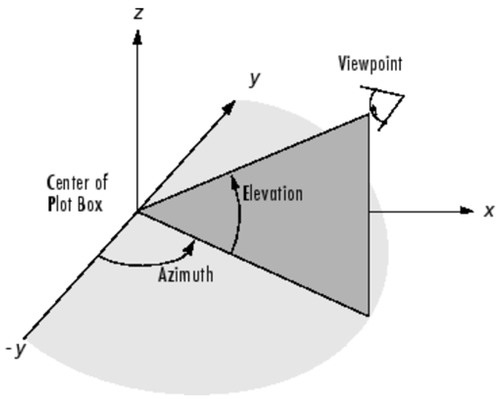


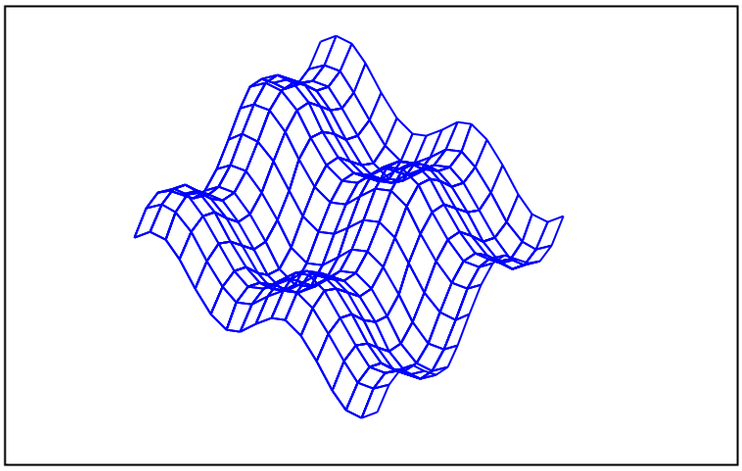
$$\left\| \begin{array}{l} \Phi := \text{eval}(F \cdot \gamma) \\ \text{augment}(\text{col}(\Phi, 1), \text{col}(\Phi, 2)) \end{array} \right\|$$

Using $\Omega := [\,30\ 0\ -37.5\,]\ °$

$$\gamma := EulerRot(\Omega) = \begin{bmatrix} 0.7934 & -0.5272 & 0.3044 \\ 0.6088 & 0.6871 & -0.3967 \\ 0 & 0.5 & 0.866 \end{bmatrix}$$

Are those the matlab defaults?





$$\Phi := \text{eval}(F \cdot \gamma)$$
$$\text{augment}(\text{col}(\Phi, 1), \text{col}(\Phi, 2))$$

Default 2-D and 3-D Views

MATLAB automatically selects a viewpoint that is determined by whether the plot is 2-D or 3-D:

- For 2-D plots, the default is azimuth = 0° and elevation = 90°.
- For 3-D plots, the default is azimuth = -37.5° and elevation = 30°.

Matlab:

https://la.mathworks.com/help/matlab/ref/view.html
https://la.mathworks.com/help/matlab/creating_plots/setting-the-viewpoint-with-azimuth-and-elevation.html?lang=en

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