ABV-Indian Institute of Information Technology and Management
Gwalior

Computer Graphics Lab

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Assignment-1

(Object representation)

(IMIT-3105)

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CG-Lab-Assgnment-1

- Task-1 : Plot the following 3D-surfaces

  A. Ellipsoid defined by: $x(\theta,\phi) = a\sin\phi\cos\theta$, $y(\theta,\phi) = b\sin\phi\sin\theta$, and $z(\theta,\phi) = c\cos\phi : 0 \le \theta \le 2\pi$ and $0 \le \phi \le \pi$, and $(a,b,c) = (1,2,3)$

  B. Torus defined by : $x(\theta,\phi) = a(r+\sin\phi)\cos\theta$, $y(\theta,\phi) = b(r+\sin\phi)\sin\theta$, and $z(\theta,\phi) = c\cos\phi$ for $0 \le \theta \le 2\pi$ and $0 \le \phi \le \pi$, and $(a,b,c,r) = (1,2,3,2)$.

- Task-2 : Plot the super-ellipsoid defined by:

$$\left[\left(\frac{x}{a}\right)^{2/s_2} + \left(\frac{y}{b}\right)^{2/s_2}\right]^{s_2/s_1} + \left(\frac{z}{c}\right)^{2/s_1} = 1$$

  A. For: $(a,b,c) = (1,2,3)$, $s_1 = 1$, and $s_2 = 0.2, 0.4, 0.8, 1, 1.5, 2$

  B. For: $(a,b,c) = (1,2,3)$, $s_2 = 1$, and $s_1 = 0.2, 0.4, 0.8, 1, 1.5,$

Note: Use any programming language (Matlab/Python/OpenGL) to plot above surfaces.

Thank You!