

1163-05-1120 **John Maharry*** (maharry.1@osu.edu). *Graph structures and flexibility of surface embeddings.*

We will give a survey of some results on the flexibility of graph embeddings on surfaces. The parameters involved include connectivity, representativity (face-width) and the genus of the surface. All flexibility of embeddings on the Plane and on the Projective plane are known [Whitney; M. and Slilaty]. Robertson, Zha and Zhao showed that representativity $\rho(\sigma) \geq 4$ guarantees a unique labeled embedding on the Torus except for a single case. With Zha, we show that $\rho(\sigma) \geq 4$ guarantees uniqueness of labeled embeddings on the Klein bottle. Finally, if a graph has a 4-representative embedding on the Torus it must be orientably simple meaning that it does not have an embedding on the Klein bottle. (Received September 14, 2020)