

TECHNIQUES FOR SURFACE MODELLING

Course : Computer Aided Machine Drawing

19ME304

Unit -2 Geometric Modeling

II Year / III Semester

**Mechatronics and Mechanical
Engineering (AM)**

TOPIC OF THE DAY



SURFACE MODELING

- It is the technique for the representation of the objects or components by surface.
- Objects can be clearly interpreted by the users.
- No available about the interior of the solid.
- Applications are modeling of automobile bodies, ships, aerospace structures, tools and dies.





SURFACE MODELING TECHNIQUES

- Surface patch
- Coons patch
- Bicubic patch
 - Hermite surfaces
 - Bezier Surfaces
 - B-spline surfaces

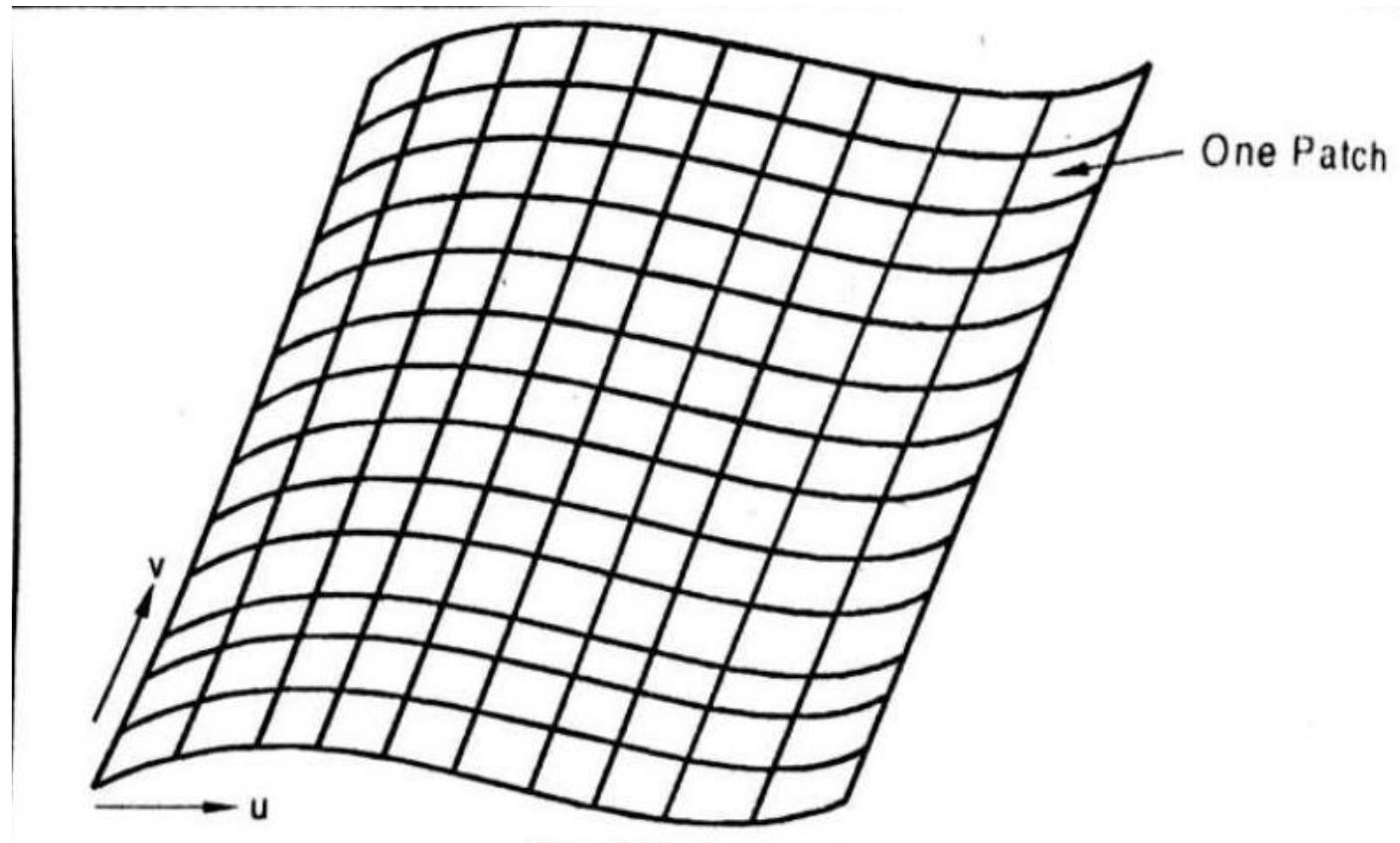
SURFACE PATCH

- It is defined in terms of point data will usually based on the rectangular array data points.
- In computer graphics the parametric surface are sometimes called patches, curved surfaces.
- The building blocks of the surfaces are known as surface patch.
- Generally u and v are the two variables used to represent a patch.

$$P(u, v) = [x \quad y \quad z]^T = [x(u, v) \quad y(u, v) \quad z(u, v)]^T$$

$$u_{min} \leq u \leq u_{max} \text{ and } v_{min} \leq v \leq v_{max}$$

SURFACE PATCH

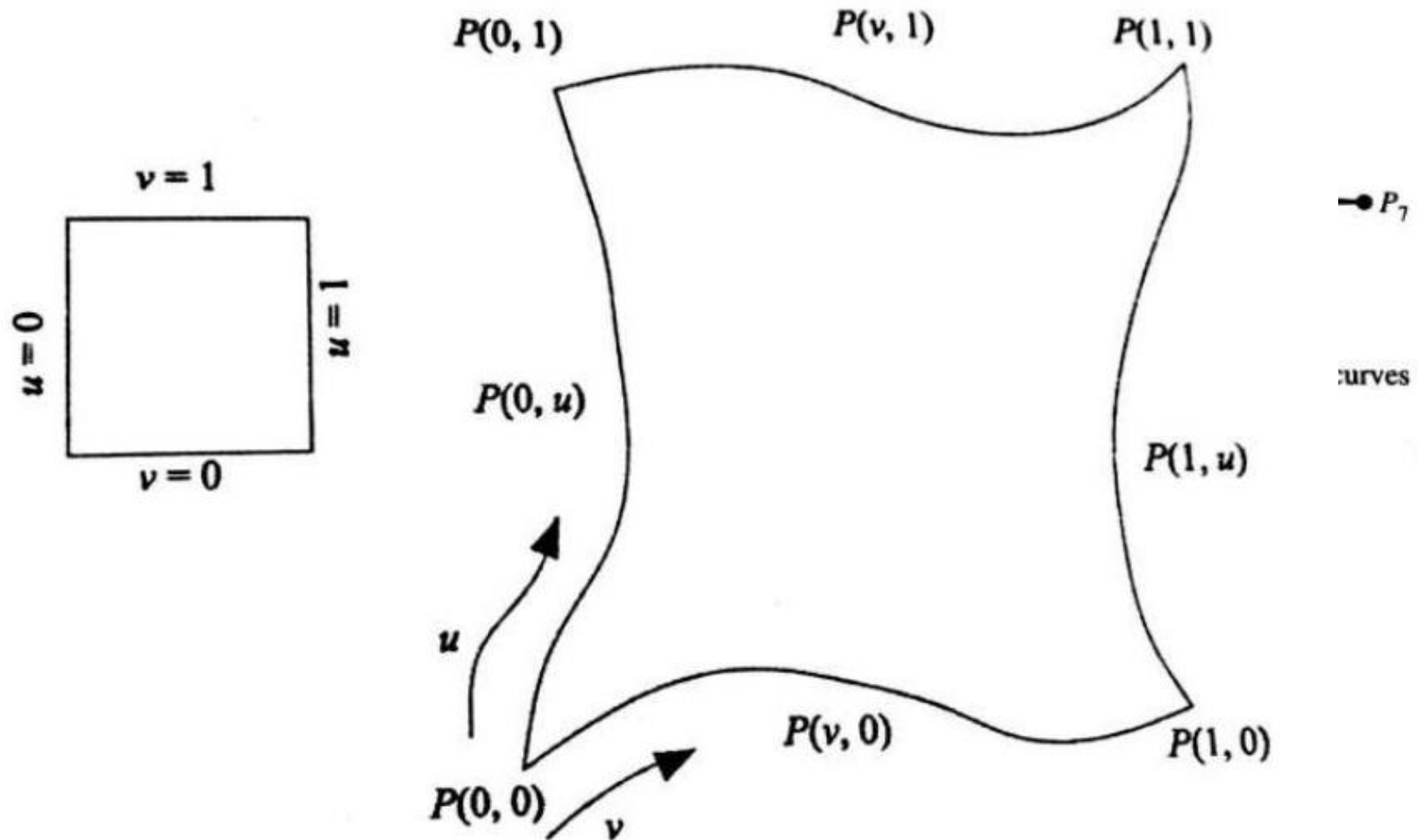


COONS PATCH

- A linear interpolation between four bounded curve is used to generate the coons surface, is called coons patch.
- The coons formulations interpolate to an infinite number of control points to generate the surface and it is referred in the form of transfinite interpolation.

$$P(u, v) = \{P(u, 0)(1 - v) + P(u, 1)v\} + \{P(0, v)(1 - u) + P(1, v)u\}$$

CONTI...





REFERENCES

1. Ibrahim Zeid “Mastering CAD CAM” Tata McGraw-Hill Publishing Co.2007.
2. Radhakrishnan P, Subramanyan S. and Raju V., “CAD/CAM/CIM”, 2nd Edition, New Age International (P) Ltd, New Delhi, 2000.

