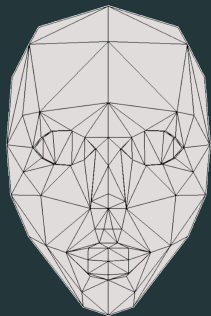


POINT NORMAL TRIANGLES

Rick van Veen Laura Baakman

December 14, 2015

Advanced Computer Graphics



INPUT MESH



GOURAUD



PN GEOMETRY

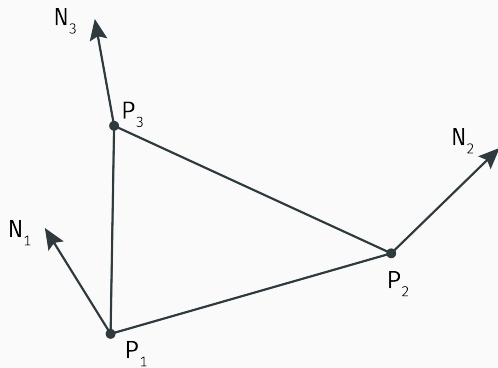


PN TRIANGLES

SINGLE PN TRIANGLE

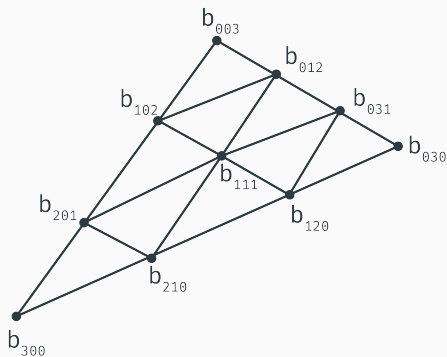
CUBIC BÉZIER TRIANGLES

What are they.



Input primitive

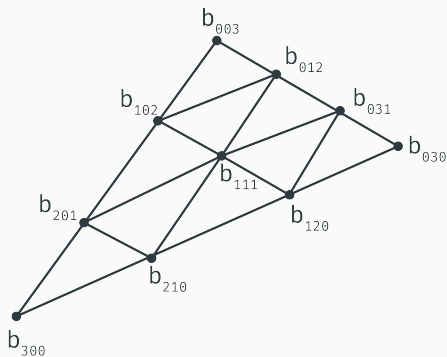
GEOMETRY - STEP 1



Control net

$$b_{ijk} = (iP_1 + jP_2 + kP_3)/3$$

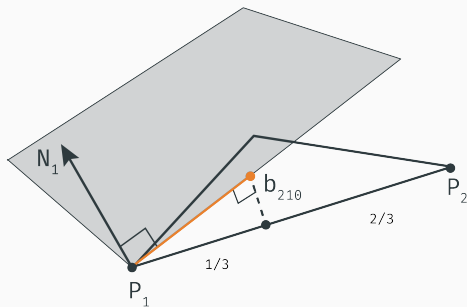
GEOMETRY - STEP 1



Control net

$$b_{ijk} = (iP_1 + jP_2 + kP_3)/3$$

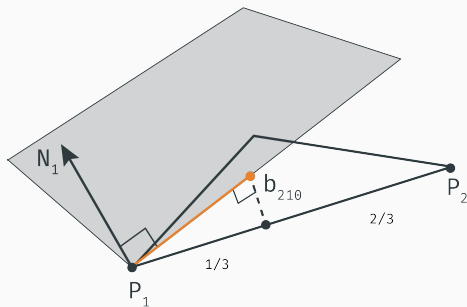
GEOMETRY - STEP 2



Normal projection

$$A^2 + B^2 = C^2$$

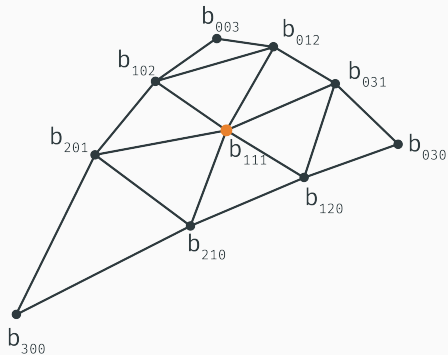
GEOMETRY - STEP 2



Normal projection

$$A^2 + B^2 = C^2$$

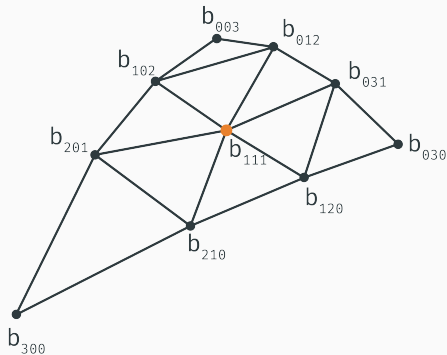
GEOMETRY - STEP 3



Center control point

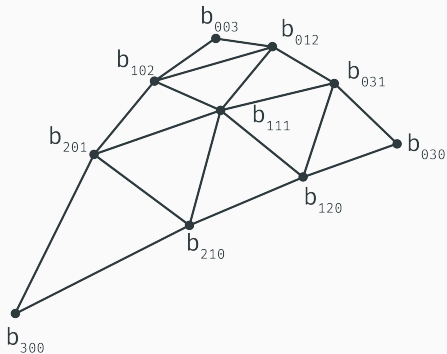
$$A^2 + B^2 = C^2$$

GEOMETRY - STEP 3

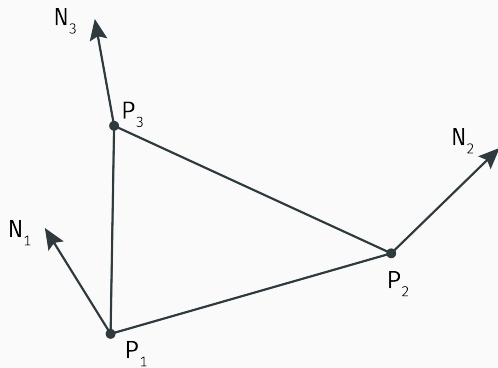


Center control point

$$A^2 + B^2 = C^2$$

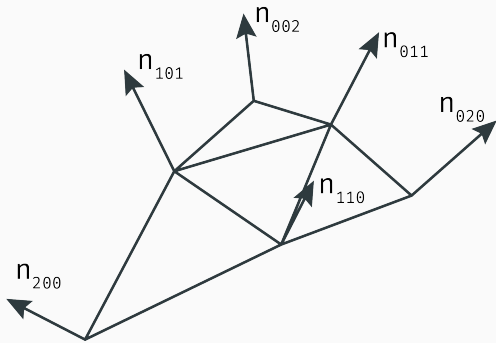


NORMALS



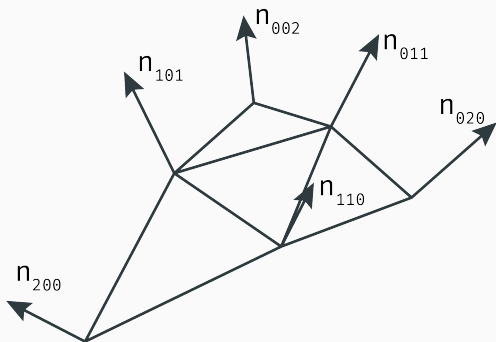
Input primitive

NORMALS



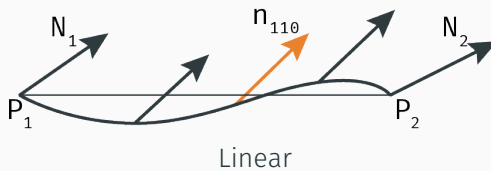
$$A^2 + B^2 = C^2$$

NORMALS



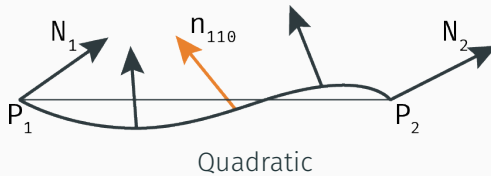
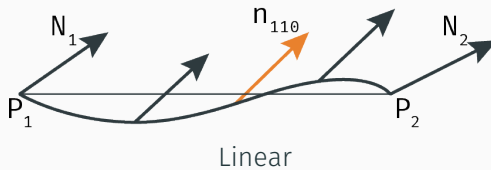
$$A^2 + B^2 = C^2$$

NORMALS - THEORY

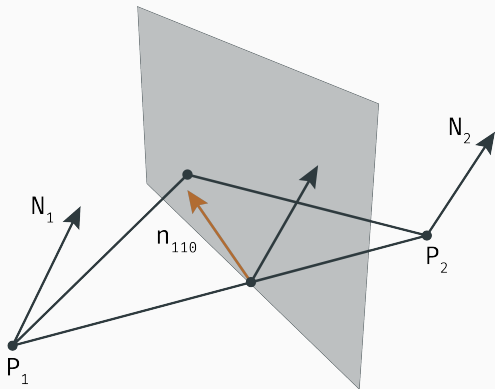


Quadratic

NORMALS - THEORY

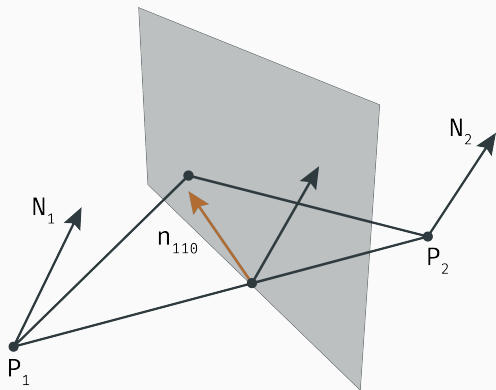


NORMALS - THEORY



$$A^2 + B^2 = C^2$$

NORMALS - THEORY



$$A^2 + B^2 = C^2$$

NORMALS - RESULT



Linear

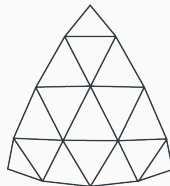
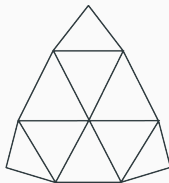
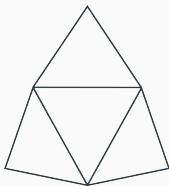
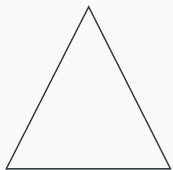


Quadratic

Barycentric coordinates recap

LEVEL OF DETAIL

LOD verhaal



0



1



2



3

The steps. Recap of everything construct geometry and normals and evaluate less (low lod) or more points (high lod)

A TRIANGLE MESH

Shared normals + [Thales of Milet, 500 BC]?

Continuity recap?

Continuity

Sharp edges

GRAPHICS PIPELINE

Waarom waren PN triangles hip in 2001? Plus pipeline

Hoe zou je het nu kunnen implementeren? Plus pipeline

CONCLUSION

Questions?

REFERENCES

References