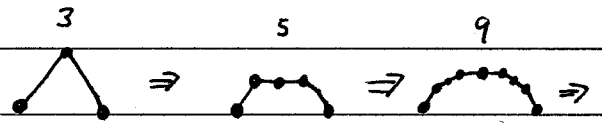


Subdivision Curves

Bezier (mid point, keep going)



Converges $\rightarrow \infty$ iterations
quadratic

double / filter

① insert midpoints

② average \leftarrow repeat N times until converges

LIMIT CURVE

Chaiken Corner Cutting ($\frac{1}{4}$ $\frac{3}{4}$)

corner cutting

① insert midpoints

② move old points ~~half way~~ \leftarrow from originals?
= $\frac{1}{8} + \frac{3}{4} + \frac{1}{8}$

notice end shrinkage

better w/ closed curves

\Rightarrow Cubic B-Splines

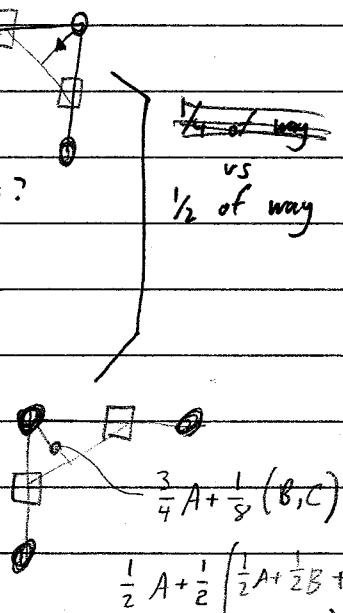
B-Spline

Smooth C^{d-1}

Convex Hull

Variation Diminishing (only decrease # of wiggles/crossings) $\frac{1}{2}A + \frac{1}{2}C$

Affine Invariant



Look up polynomial forms

\Rightarrow Triangles - Meshes $\hat{=}$ Cracking \Rightarrow Division Scheme
Triangle Division
Regular / Extraordinary

10/13 - 2

$P_0 \quad P_1 \quad P_2 \quad 3$

double $P_0 \quad P_0 \quad P_1 \quad P_1 \quad P_2 \quad P_2$

filter $P_0 \quad P_{01} \quad P_1 \quad P_{12} \quad P_2 \quad 5$

$P_0 \quad P_0 \quad P_{01} \quad P_{01} \quad P_1 \quad P_1 \quad P_{12} \quad P_{12} \quad P_2 \quad P_2$

$P_0 \quad P_{001} \quad P_{01} \quad P_{011} \quad P_1 \quad P_{112} \quad P_{12} \quad P_{122} \quad P_2 \quad 9$

$P_0 \quad P_1 \quad P_2 \quad P_3 \quad 4$

double $P_0 \quad P_0 \quad P_1 \quad P_1 \quad P_2 \quad P_2 \quad P_3 \quad P_3 \quad 8$

filter $P_0 \quad P_{01} \quad P_1 \quad P_{12} \quad P_2 \quad P_{23} \quad P_3 \quad 7$

filter $P_{001} \quad P_{011} \quad P_{112} \quad P_{122} \quad P_{223} \quad P_{233} \quad 6$

double 12

11

10

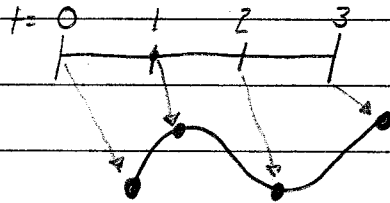
10/13 - 0

Curve parametric form

pieces

knots

Bezier conversion



Knots and control
points may not
be in sync

each piece = influenced by some #
of CP

Geometric Construction \rightarrow polynomials