Visual Data Analytics
Isolines & Isosurfaces

Dr. Johannes Kehrer

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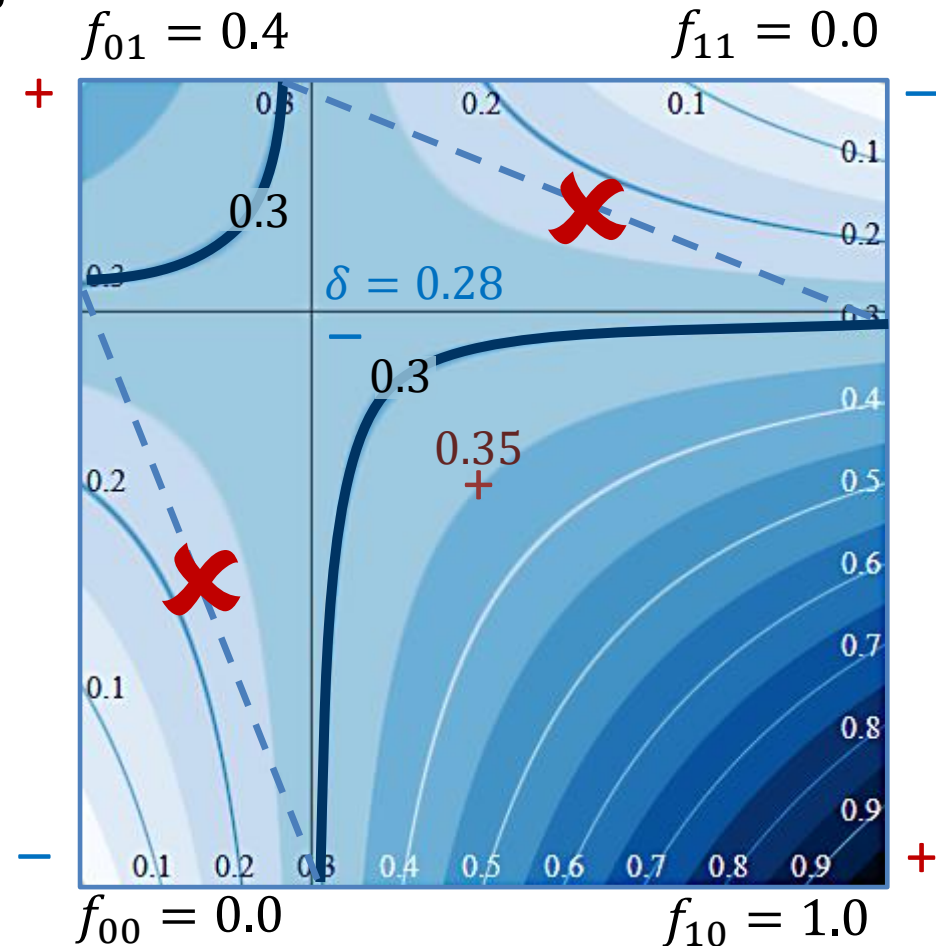
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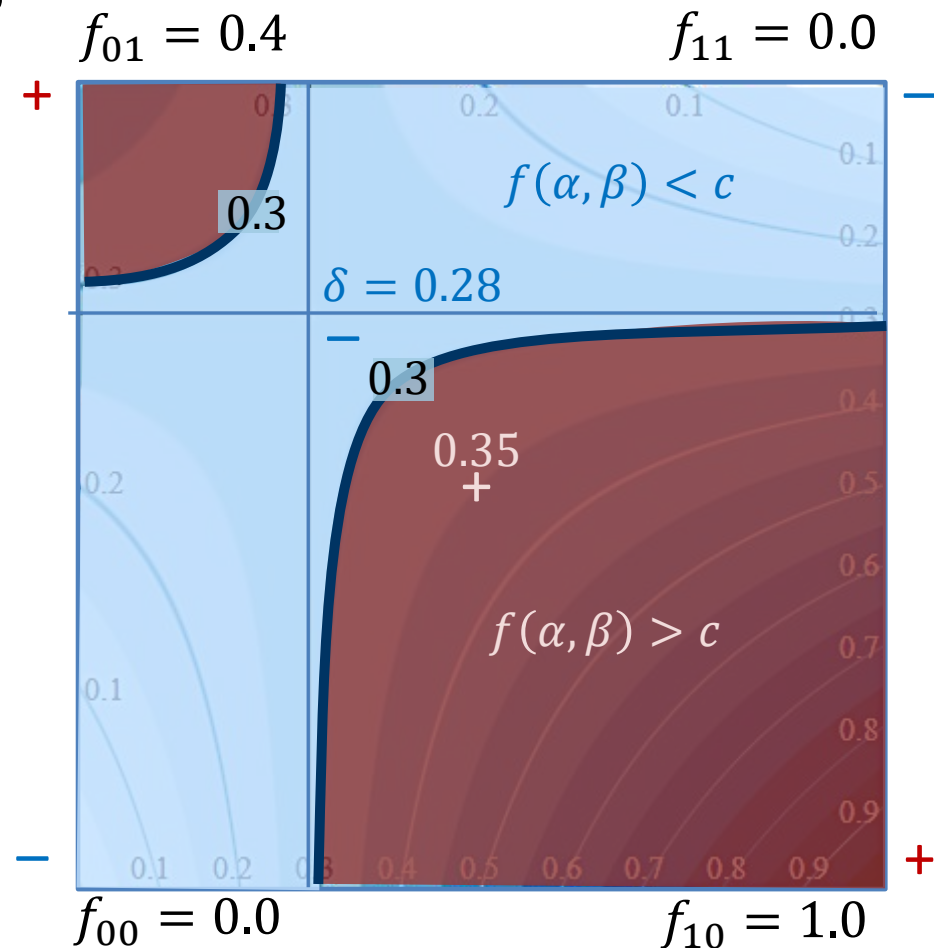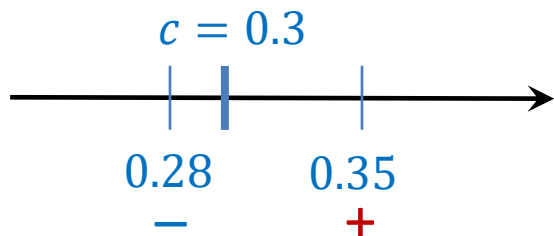
Isolines

- ## When does the midpoint decider **not** work

  - **Example:** Iso-line for $c = 0.3$

  - Value at midpoint: 0.35

  - Evaluating the asymptotic decider, we get $\delta = 0.28$ at intersection of asymptotes

  - The midpoint decider would give us wrong isolines

$f_{01} = 0.4$　　　　　　　　$f_{11} = 0.0$

$\delta = 0.28$

0.35

$f_{00} = 0.0$　　　　　　　　$f_{10} = 1.0$

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Isolines

- ## When does the midpoint decider **not** work
  - **Example:** Iso-line for $c = 0.3$
  - Value at midpoint: 0.35
  - Evaluating the asymptotic decider, we get $\delta = 0.28$ at intersection of asymptotes
  - The midpoint decider would give us wrong isolines

$f_{01} = 0.4$ $f_{11} = 0.0$

$+$ 0.3   0.2   0.1 $-$

$f(\alpha, \beta) < c$

0.3

$\delta = 0.28$

$-$

0.3

0.35
$+$

$f(\alpha, \beta) > c$

$-$ 0.1   0.2   0.3   0.4   0.5   0.6   0.7   0.8   0.9 $+$

$f_{00} = 0.0$ $f_{10} = 1.0$

$c = 0.3$

0.28   0.35
$-$ $+$

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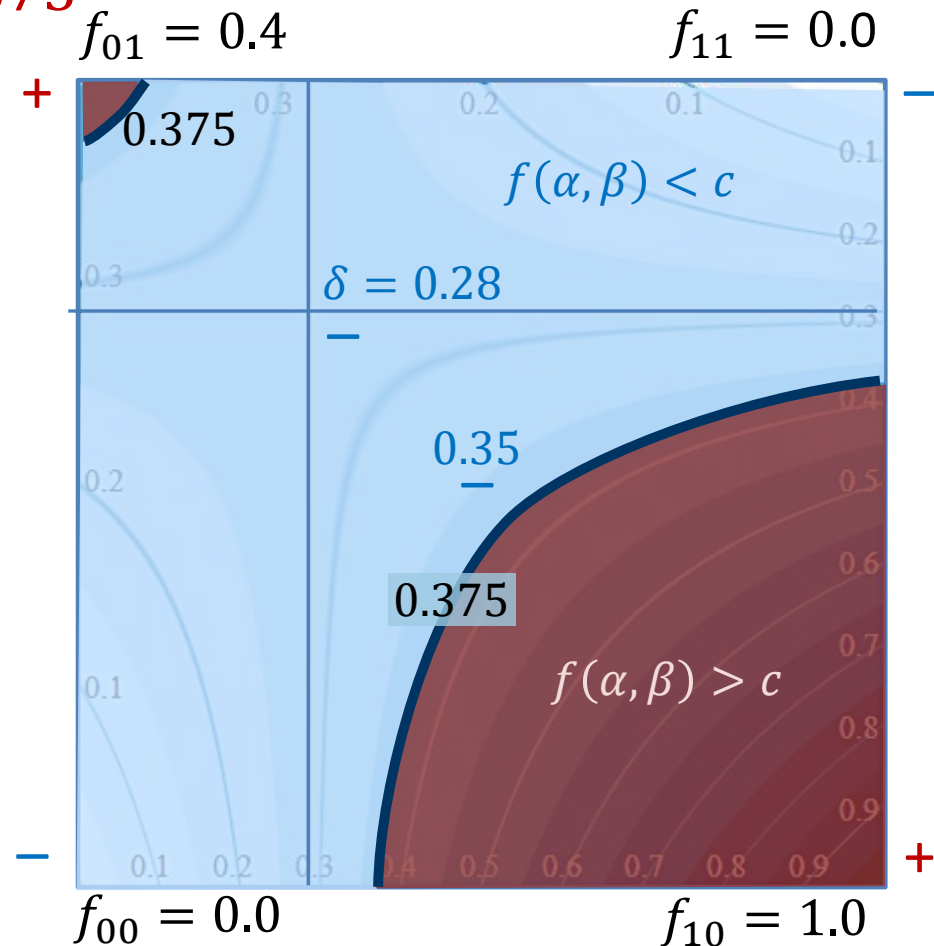multivis.net/lecture/bilinear.html
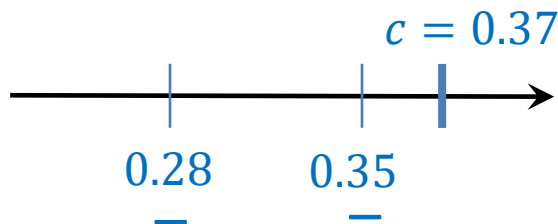
Isolines

- ## When does the midpoint decider work

  - **Example:** Iso-line for $c = 0.375$
  - Value at midpoint: 0.35
  - Evaluating the asymptotic decider, we get $\delta = 0.28$ at intersection of asymptotes
  - The midpoint decider would give us the correct isolines

$f_{01} = 0.4$ $\quad$ $f_{11} = 0.0$

$f(\alpha, \beta) < c$

$\delta = 0.28$

0.35

0.375

$f(\alpha, \beta) > c$

$f_{00} = 0.0$ $\quad$ $f_{10} = 1.0$

$c = 0.37$

0.28 $\quad$ 0.35

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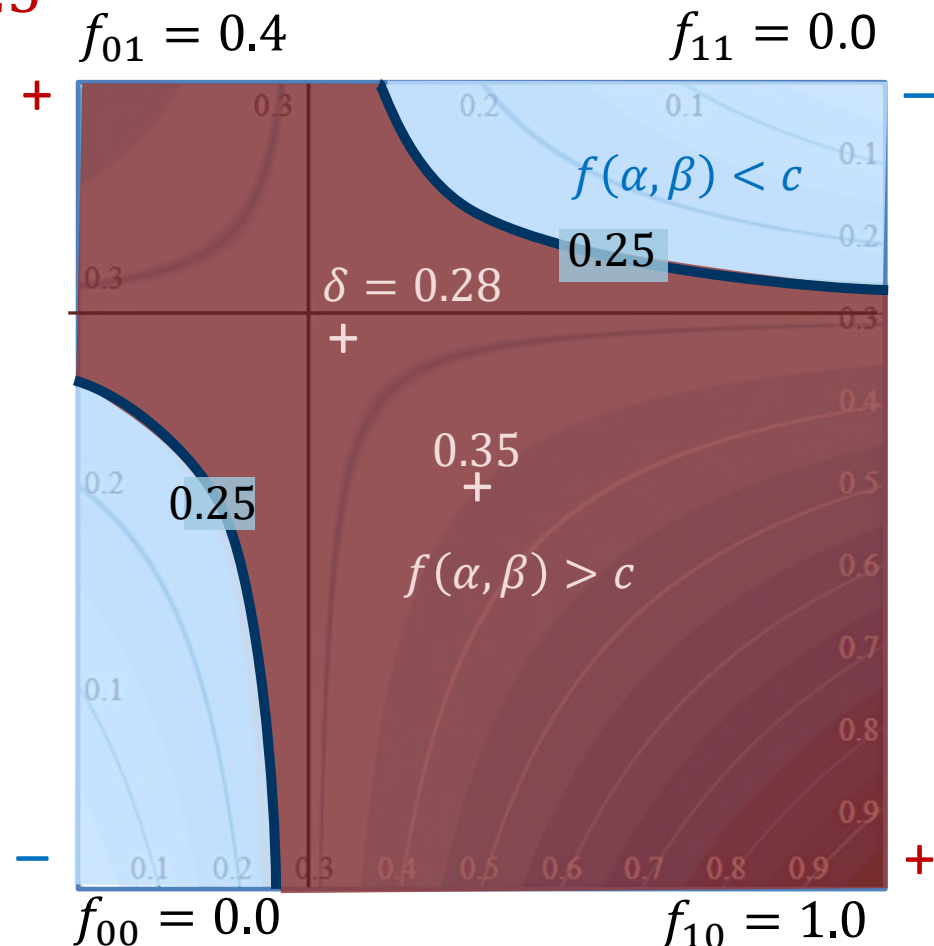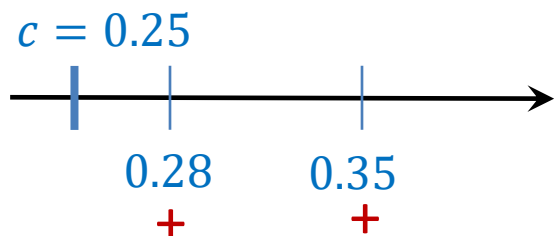
Isolines

- ## When does the midpoint decider work

  - **Example:** Iso-line for $c = 0.25$

  - Value at midpoint: 0.35

  - Evaluating the asymptotic decider, we get $\delta = 0.28$ at intersection of asymptotes

  - The midpoint decider would give us the correct isolines

$f_{01} = 0.4$ $f_{11} = 0.0$

$f(\alpha, \beta) < c$

0.25

$\delta = 0.28$

0.25

0.35

$f(\alpha, \beta) > c$

$f_{00} = 0.0$ $f_{10} = 1.0$

$c = 0.25$

0.28   0.35

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Isolines

- ## When does the midpoint decider **not** work

  - **Example:** Iso-line for $c = 0.3$
  - Value at midpoint: 0.35
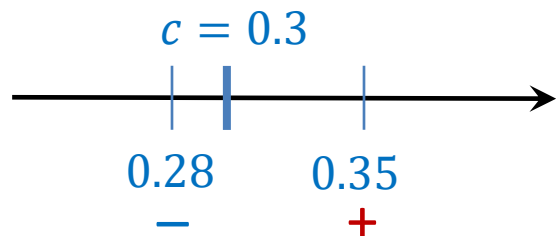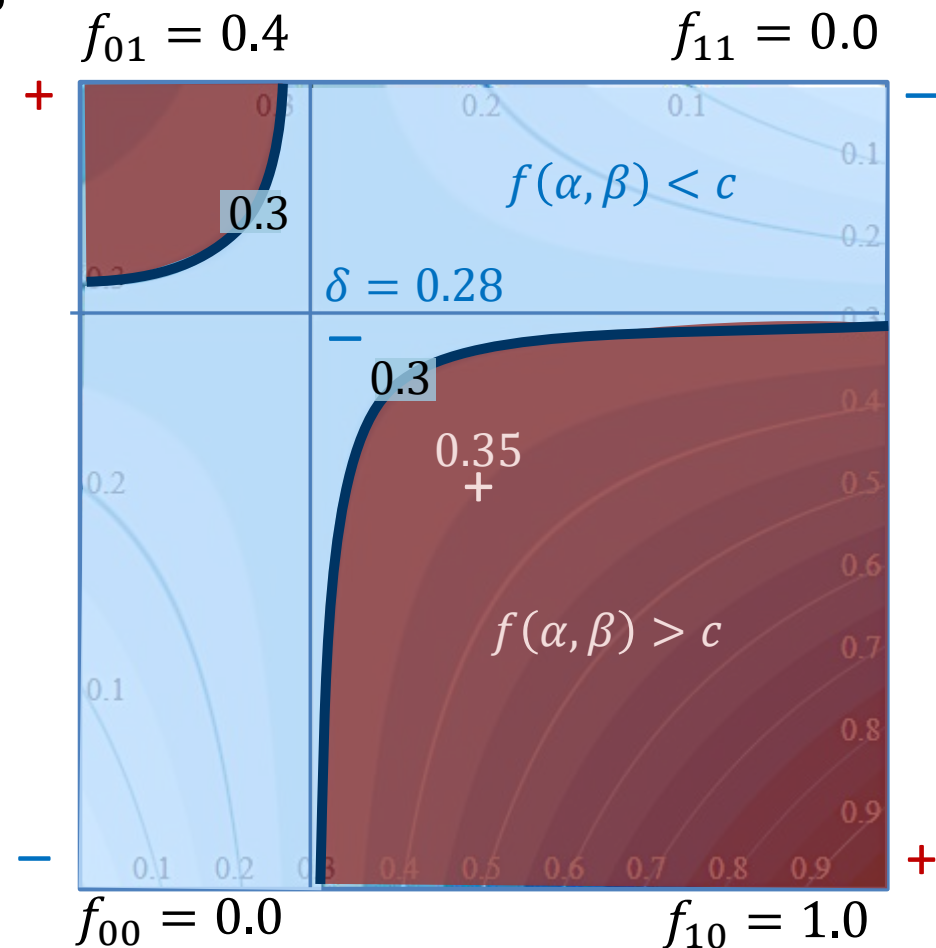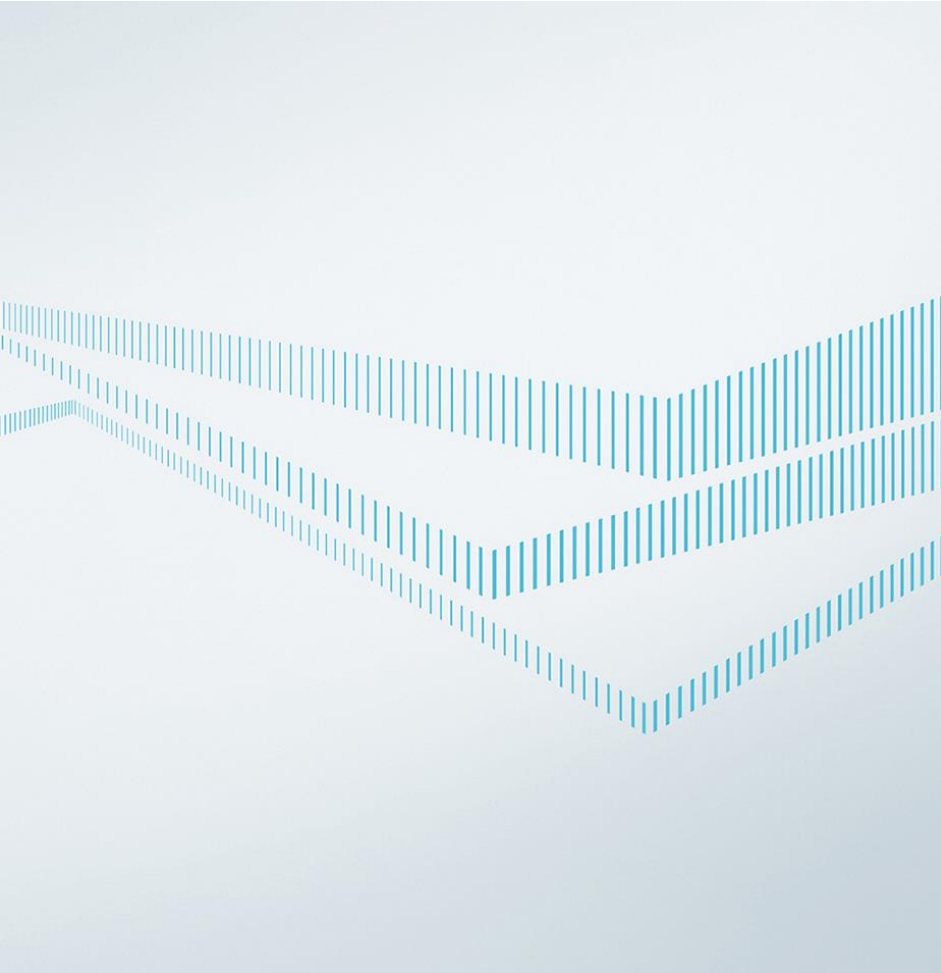 - Evaluating the asymptotic decider, we get $\delta = 0.28$ at intersection of asymptotes
  - The midpoint decider would give us wrong isolines

    $c = 0.3$

    0.28   0.35
    $-$ $+$

  - **Incorrect results for** $0.28 < c < 0.35$

$f_{01} = 0.4$ $f_{11} = 0.0$

$f(\alpha, \beta) < c$

$\delta = 0.28$

0.35

$f(\alpha, \beta) > c$

$f_{00} = 0.0$ $f_{10} = 1.0$

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