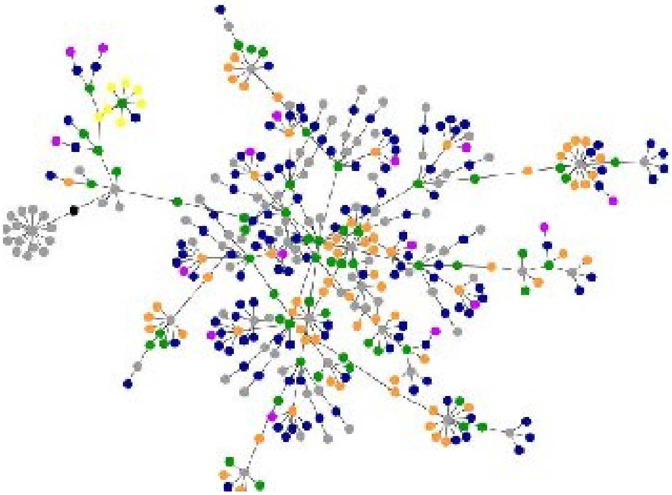
Fall 2012 Welcome

Steven F. Bellenot

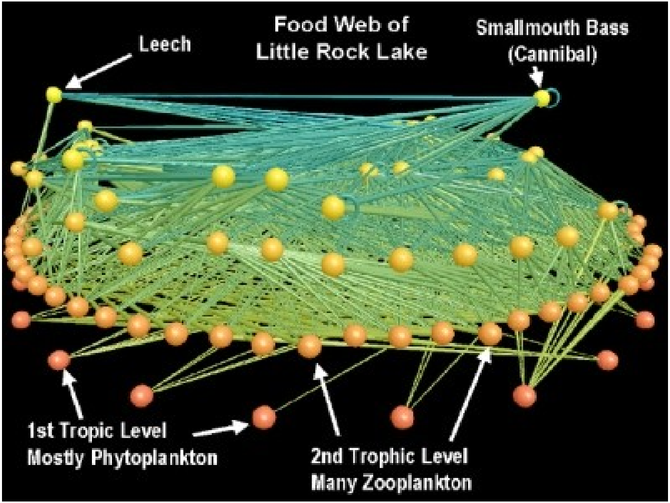
Department of Mathematics
Florida State University

Fall 2012
Florida State University, Tallahassee, FL
Aug 24, 2012

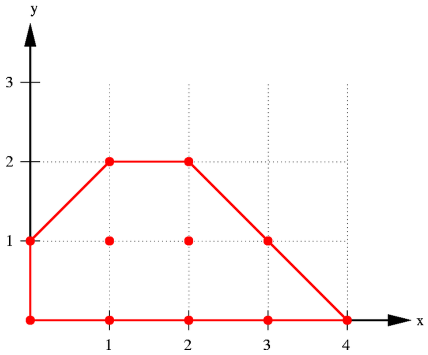
Social Networks



Food Web Networks

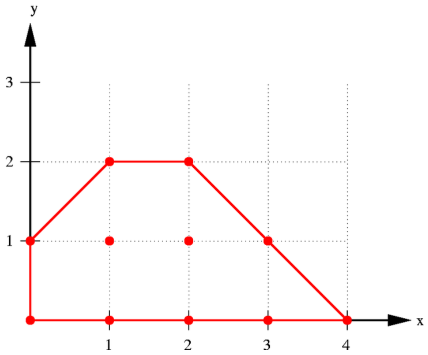


Convex Polyhedra



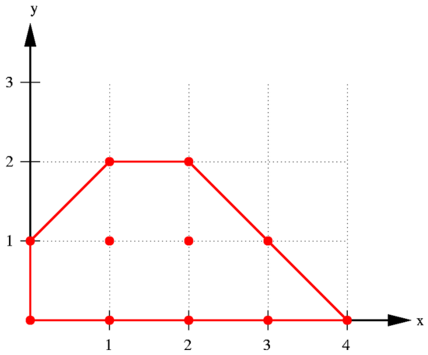
A *convex polyhedra* is the convex hull of a finite set of points in $\mathbb{R}^n$. Network *vertices* are the extreme points (i.e. $(2,2)$ and $(0,4)$ but not $(1,1)$ nor $(3,1)$)and Network *edges* are extreme line segments between vertices (i.e $[(2,2),(0,4)]$ but not $[(0,0),(2,2)]$).Two vertices are *friends* if they are joined by an edge.

Convex Polyhedra



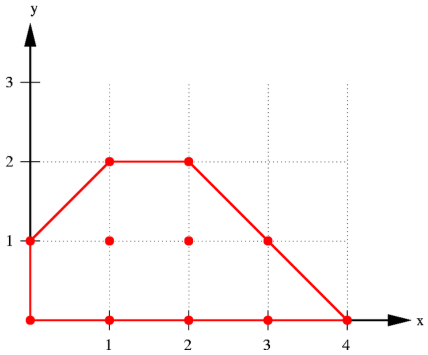
A *convex polyhedra* is the convex hull of a finite set of points in $\mathbb{R}^n$. Network *vertices* are the extreme points (i.e. $(2,2)$ and $(0,4)$ but not $(1,1)$ nor $(3,1)$)and Network *edges* are extreme line segments between vertices (i.e $[(2,2),(0,4)]$ but not $[(0,0),(2,2)]$).Two vertices are *friends* if they are joined by an edge.

Convex Polyhedra



A *convex polyhedra* is the convex hull of a finite set of points in $\mathbb{R}^n$. Network *vertices* are the extreme points (i.e. $(2, 2)$ and $(0, 4)$ but not $(1, 1)$ nor $(3, 1)$)and Network *edges* are extreme line segments between vertices (i.e $[(2, 2), (0, 4)]$ but not $[(0, 0), (2, 2)]$). Two vertices are *friends* if they are joined by an edge.

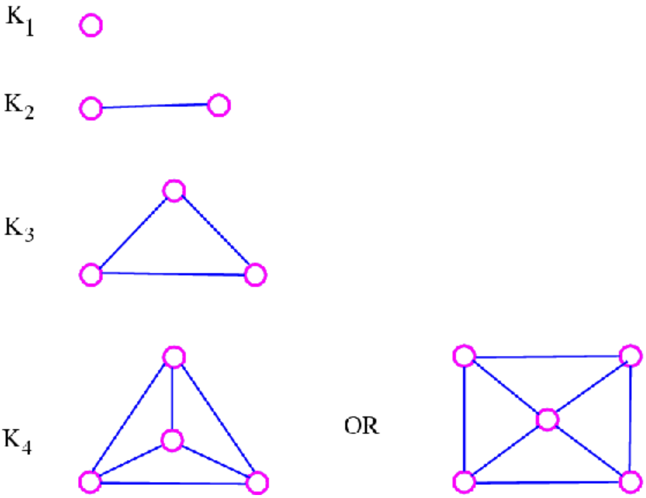
Convex Polyhedra



A *convex polyhedra* is the convex hull of a finite set of points in $\mathbb{R}^n$. Network *vertices* are the extreme points (i.e. $(2,2)$ and $(0,4)$ but not $(1,1)$ nor $(3,1)$)and Network *edges* are extreme line segments between vertices (i.e $[(2,2),(0,4)]$ but not $[(0,0),(2,2)]$).Two vertices are *friends* if they are joined by an edge.

Clicks

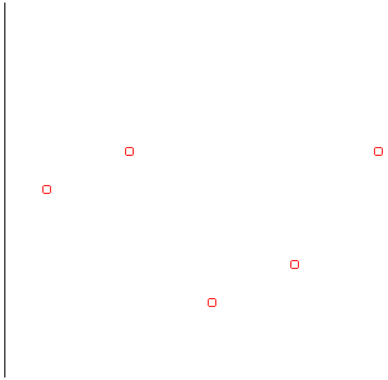
A *click* is a set of vertices, every pair of which are friends.



Max Convex Click Size in 2-Dimenisions is 3

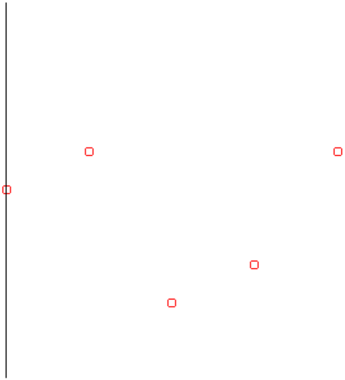
Suppose this collection of points is a max convex click

Max Convex Click Size in 2-Dimenisions is 3



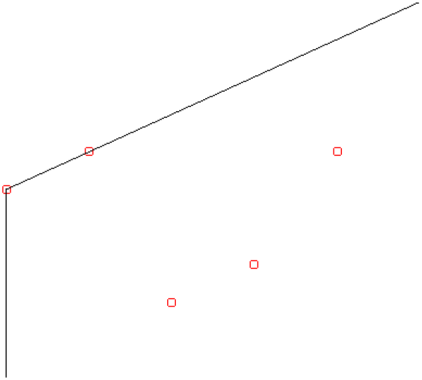
Find the leftmost point

Max Convex Click Size in 2-Dimenisions is 3



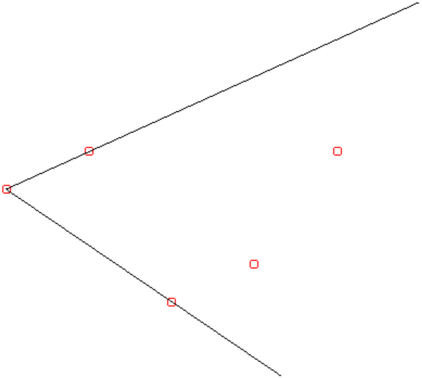
Find the next point clockwise

Max Convex Click Size in 2-Dimenisions is 3



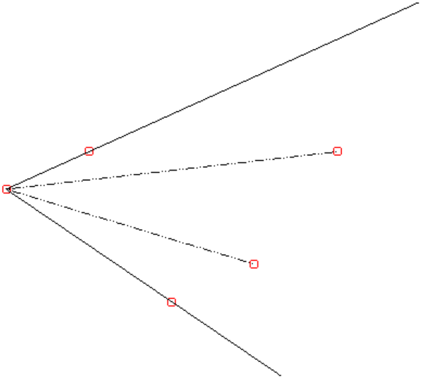
Find the next point counterclockwise

Max Convex Click Size in 2-Dimenisions is 3



Now look at the remaining points

Max Convex Click Size in 2-Dimenisions is 3

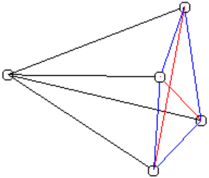


They are not extremal, so max is 3.

Max Convex Click Size in 1-Dimenision is 2

Only two vertices, leftmost and rightmost.

Max Convex Click Size in 3-Dimenision is 4



Maximal Convex Clicks Size in Dimension n

Dimension	Max Convex Click
0	1
1	2
2	3
3	4
4	?

Advisors (other than Josh) are not your friend

- Do not reply to email from students wanting to add your class just forward them to advisor@math.fsu.edu

Advisors (other than Josh) are not your friend

- Do not reply to email from students wanting to add your class just forward them to advisor@math.fsu.edu

Student Email is not your friend

- You don't have to answer email.
- But it is better to answer "See me in my office" or "Read the web page" a day or two later.

Student Email is not your friend

- You don’t have to answer email.
- But it is better to answer "See me in my office" or "Read the web page" a day or two later.

A random email to an advisors result

The advisor filled out a form. A chair of another department approved the form. International programs created a shadow course. The professor at the end of the semester discovers he is listed as the instructor of a course out of the blue. Eventually, the student shows up with a collection of math assignments and tests in a foreign language to evaluate. The professor signed nothing, he could have let the F sit.

A random email to an advisors result

The advisor filled out a form.A chair of another department approved the form.International programs created a shadow course. The professor at the end of the semester discovers he is listed as the instructor of a course out of the blue. Eventually, the student shows up with a collection of math assignments and tests in a foreign language to evaluate. The professor signed nothing, he could have let the F sit.

A random email to an advisors result

The advisor filled out a form.A chair of another department approved the form.International programs created a shadow course. The professor at the end of the semester discovers he is listed as the instructor of a course out of the blue. Eventually, the student shows up with a collection of math assignments and tests in a foreign language to evaluate. The professor signed nothing, he could have let the F sit.

The advisor filled out a form.A chair of another department approved the form.International programs created a shadow course. The professor at the end of the semester discovers he is listed as the instructor of a course out of the blue. Eventually, the student shows up with a collection of math assignments and tests in a foreign language to evaluate. The professor signed nothing, he could have let the F sit.

A random email to an advisors result

The advisor filled out a form.A chair of another department approved the form.International programs created a shadow course. The professor at the end of the semester discovers he is listed as the instructor of a course out of the blue. Eventually, the student shows up with a collection of math assignments and tests in a foreign language to evaluate. The professor signed nothing, he could have let the F sit.

A random email to an advisors result

The advisor filled out a form.A chair of another department approved the form.International programs created a shadow course. The professor at the end of the semester discovers he is listed as the instructor of a course out of the blue. Eventually, the student shows up with a collection of math assignments and tests in a foreign language to evaluate. The professor signed nothing, he could have let the F sit.

Accommodations

- The letter isn't the request. It is a basis for discussion.
- Unlimited Excused Absences. One extra excused absence.

Accommodations

- The letter isn't the request. It is a basis for discussion.
- Unlimited Excused Absences. One extra excused absence.

Accommodations

- The letter isn't the request. It is a basis for discussion.
- Unlimited Excused Absences. One extra excused absence.

Accommodations

- The letter isn't the request. It is a basis for discussion.
- Unlimited Excused Absences. One extra excused absence.

Maximal Convex Clicks Size in Dimension n

Dimension	Max Convex Click
0	1
1	2
2	3
3	4
4	∞

In 4-dimensions there is no max click size

Pick distinct t_i, $1 \le i \le n$.

The points $P_i = (t_i, t_i^2, t_i^3, t_i^4)$, $1 \le i \le n$ form a convex click.

$$f(t) = (t - t_3)^2(t - t_5)^2 = a_0 + a_1 t + a_2 t^2 + a_3 t^3 + a_4 t^4$$

Note $f(t_3) = f(t_5) = 0 < f(t_i)$ for $3 \ne i \ne 5$.
Note P_i dot product $[a_1, a_2, a_3, a_4] = f(t_i) - a_0$
We have found a linear functional the exposes the edge from P_3 to P_5.

In 4-dimensions there is no max click size

Pick distinct t_i, $1 \leq i \leq n$.
The points $P_i = (t_i, t_i^2, t_i^3, t_i^4)$, $1 \leq i \leq n$ form a convex click.

$$f(t) = (t - t_3)^2(t - t_5)^2 = a_0 + a_1 t + a_2 t^2 + a_3 t^3 + a_4 t^4$$

Note $f(t_3) = f(t_5) = 0 < f(t_i)$ for $3 \neq i \neq 5$.
Note P_i dot product $[a_1, a_2, a_3, a_4] = f(t_i) - a_0$
We have found a linear functional the exposes the edge from P_3 to P_5.

In 4-dimensions there is no max click size

Pick distinct t_i, $1 \leq i \leq n$.
The points $P_i = (t_i, t_i^2, t_i^3, t_i^4)$, $1 \leq i \leq n$ form a convex click.

$$f(t) = (t - t_3)^2(t - t_5)^2 = a_0 + a_1 t + a_2 t^2 + a_3 t^3 + a_4 t^4$$

Note $f(t_3) = f(t_5) = 0 < f(t_i)$ for $3 \neq i \neq 5$.
Note P_i dot product $[a_1, a_2, a_3, a_4] = f(t_i) - a_0$
We have found a linear functional the exposes the edge from P_3 to P_5.

In 4-dimensions there is no max click size

Pick distinct t_i, $1 \leq i \leq n$.
The points $P_i = (t_i, t_i^2, t_i^3, t_i^4)$, $1 \leq i \leq n$ form a convex click.

$$f(t) = (t - t_3)^2 (t - t_5)^2 = a_0 + a_1 t + a_2 t^2 + a_3 t^3 + a_4 t^4$$

Note $f(t_3) = f(t_5) = 0 < f(t_i)$ for $3 \neq i \neq 5$.
Note P_i dot product $[a_1, a_2, a_3, a_4] = f(t_i) - a_0$
We have found a linear functional the exposes the edge from P_3 to P_5.

In 4-dimensions there is no max click size

Pick distinct t_i, $1 \leq i \leq n$.
The points $P_i = (t_i, t_i^2, t_i^3, t_i^4)$, $1 \leq i \leq n$ form a convex click.

$$f(t) = (t - t_3)^2(t - t_5)^2 = a_0 + a_1 t + a_2 t^2 + a_3 t^3 + a_4 t^4$$

Note $f(t_3) = f(t_5) = 0 < f(t_i)$ for $3 \neq i \neq 5$.
Note P_i dot product $[a_1, a_2, a_3, a_4] = f(t_i) - a_0$
We have found a linear functional the exposes the edge from P_3 to P_5.

In 4-dimensions there is no max click size

Pick distinct t_i, $1 \leq i \leq n$.
The points $P_i = (t_i, t_i^2, t_i^3, t_i^4)$, $1 \leq i \leq n$ form a convex click.

$$f(t) = (t - t_3)^2(t - t_5)^2 = a_0 + a_1 t + a_2 t^2 + a_3 t^3 + a_4 t^4$$

Note $f(t_3) = f(t_5) = 0 < f(t_i)$ for $3 \neq i \neq 5$.
Note P_i dot product $[a_1, a_2, a_3, a_4] = f(t_i) - a_0$
We have found a linear functional the exposes the edge from P_3 to P_5.