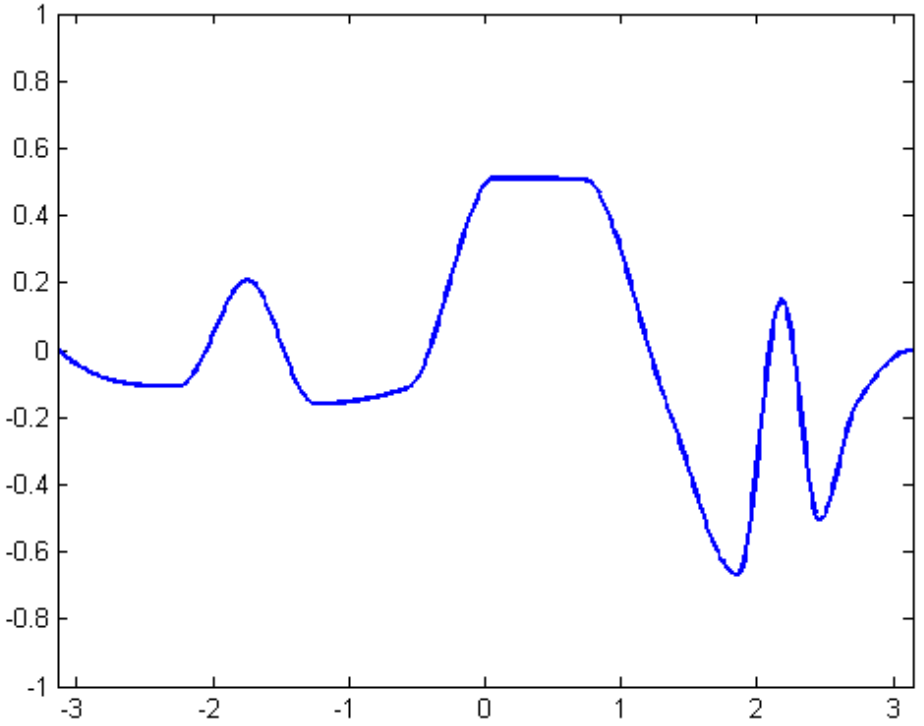
Testmodellek keresztmetszetei

Fábián Gábor

2014. 02. 01.

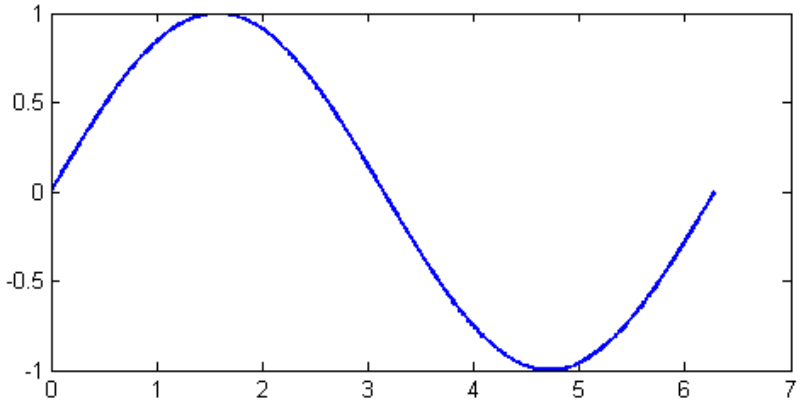
1D függvények

- Hogyan közelítsünk egy tetszőleges 1D függvényt?

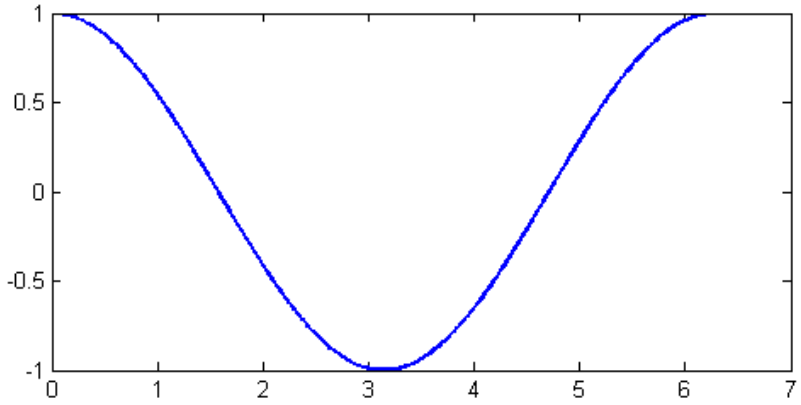


Egyszerűbb rendszerek

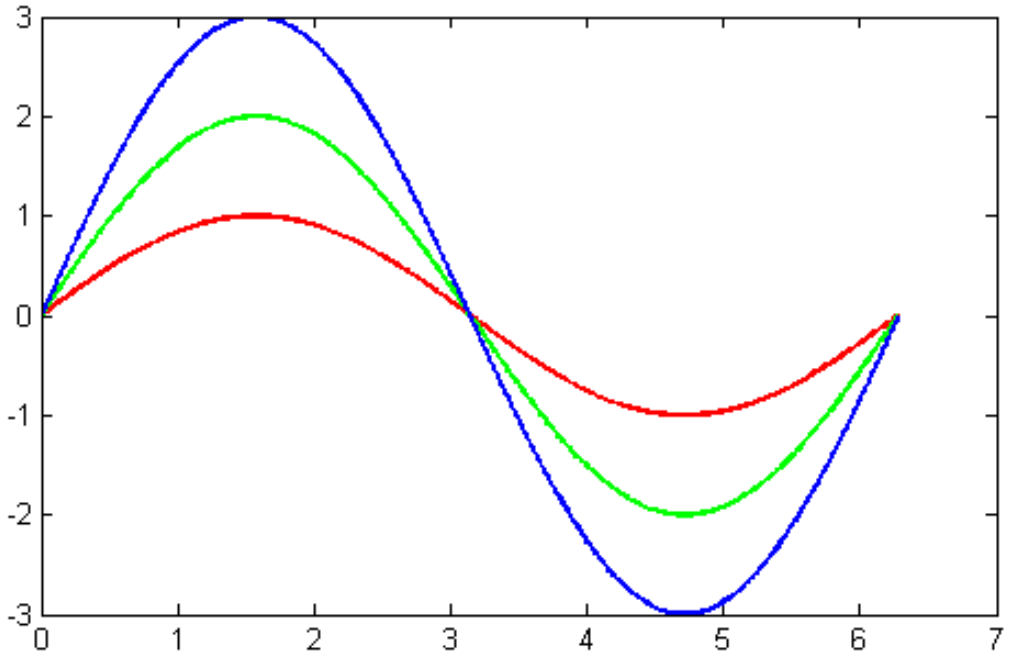
sin(x)



cos(x)



Amplitúdó

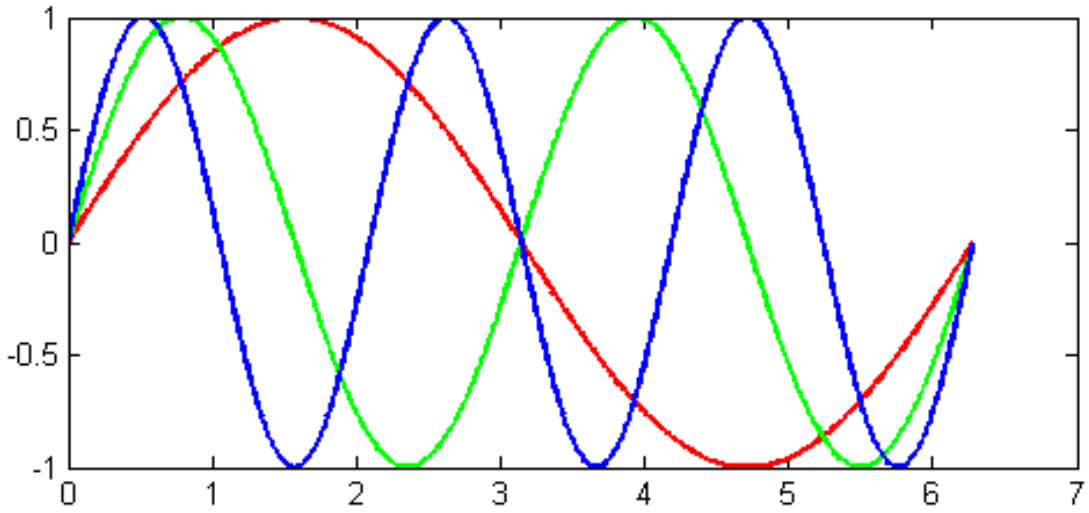


1 sin(x)

2 sin(x)

3 sin(x)

Frekvencia

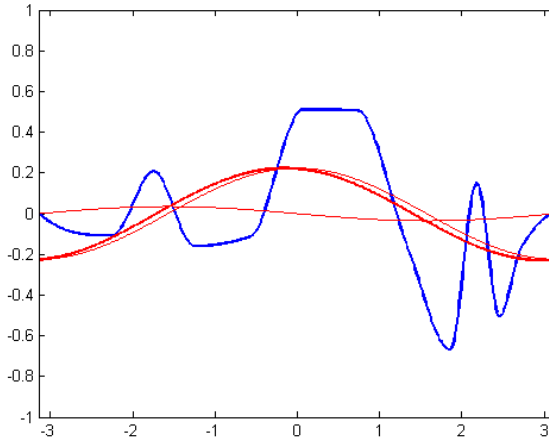


$\sin(1x)$

$\sin(2x)$

$\sin(3x)$

Közelítés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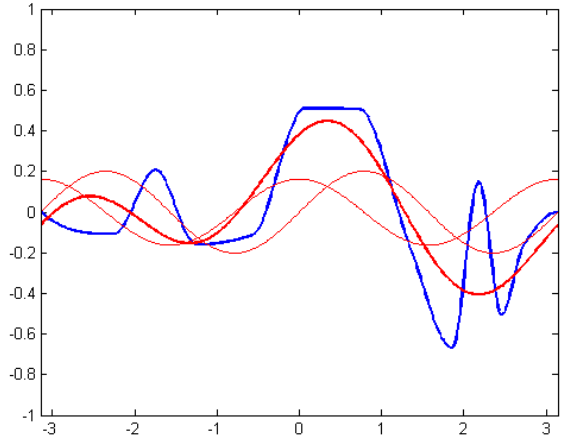
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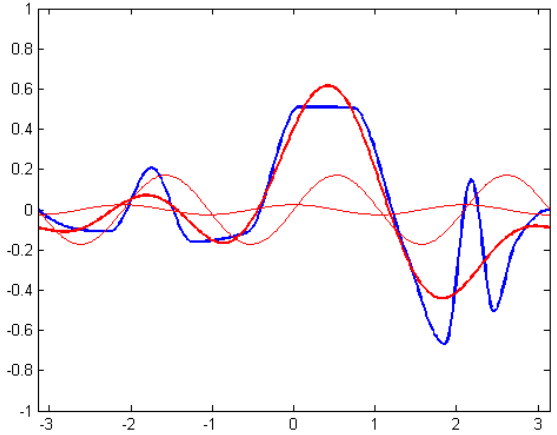
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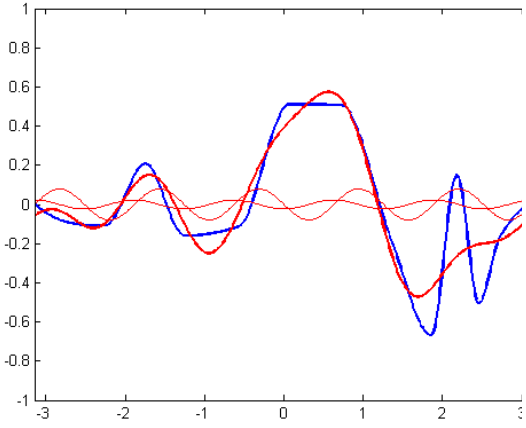
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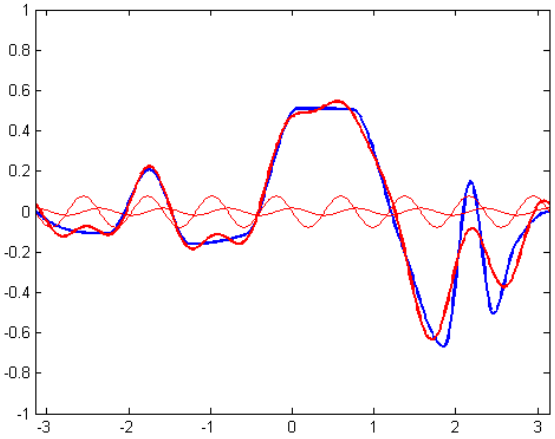
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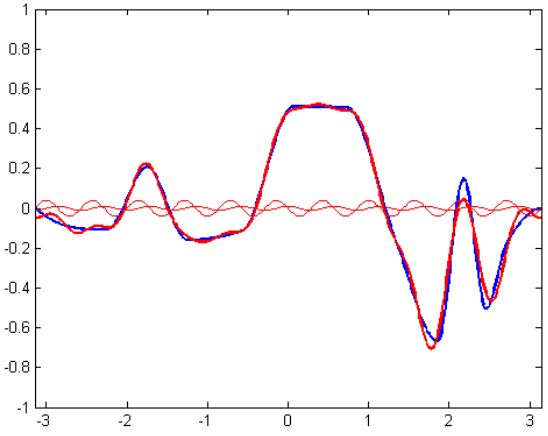
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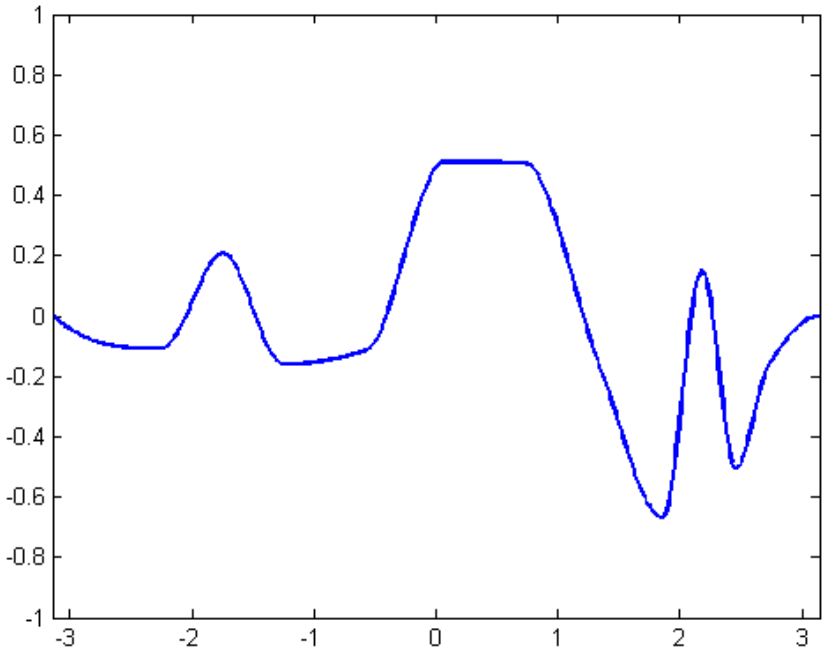
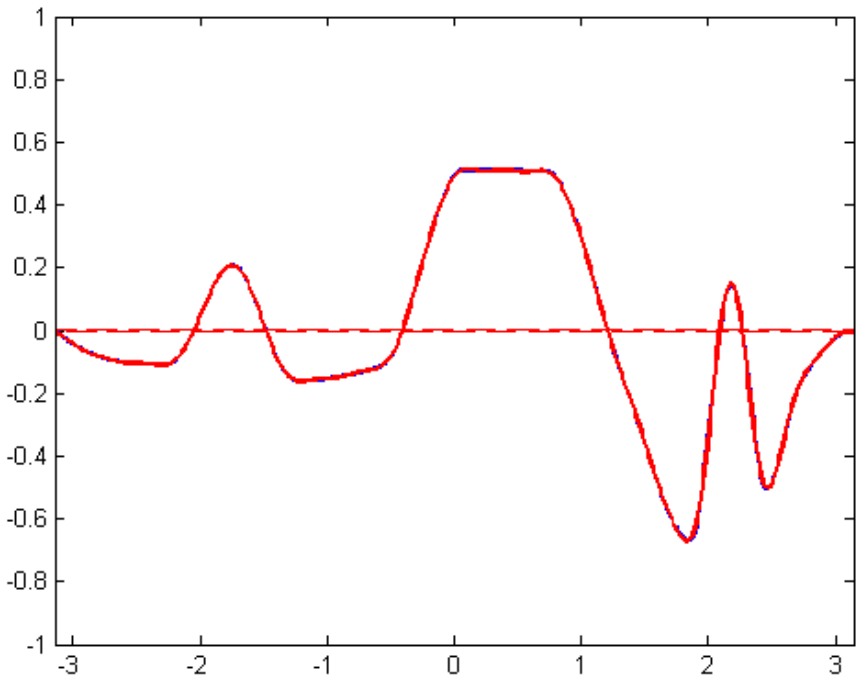
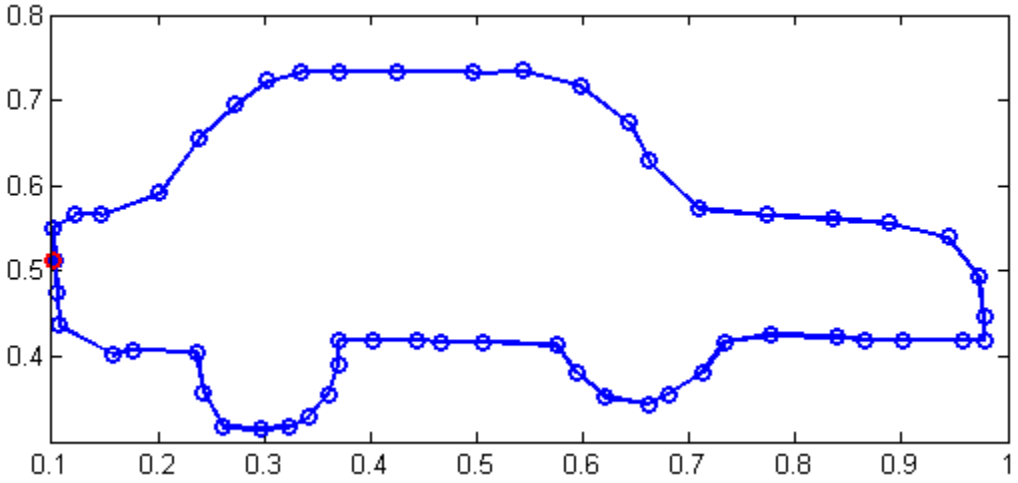
Jó, de mi a helyzet 2D-ben?



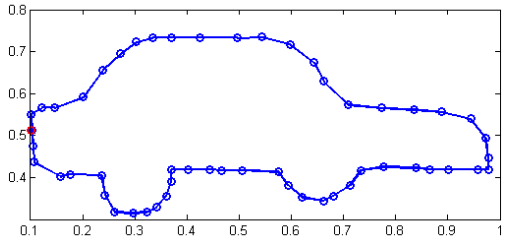


Hogyan közelíthetünk élhurkot?

(x,y)

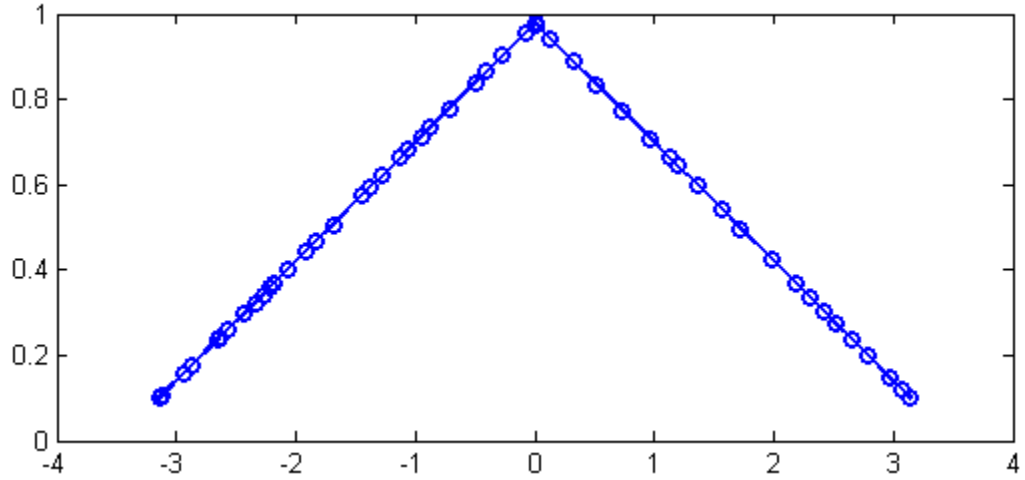


Paraméterezés

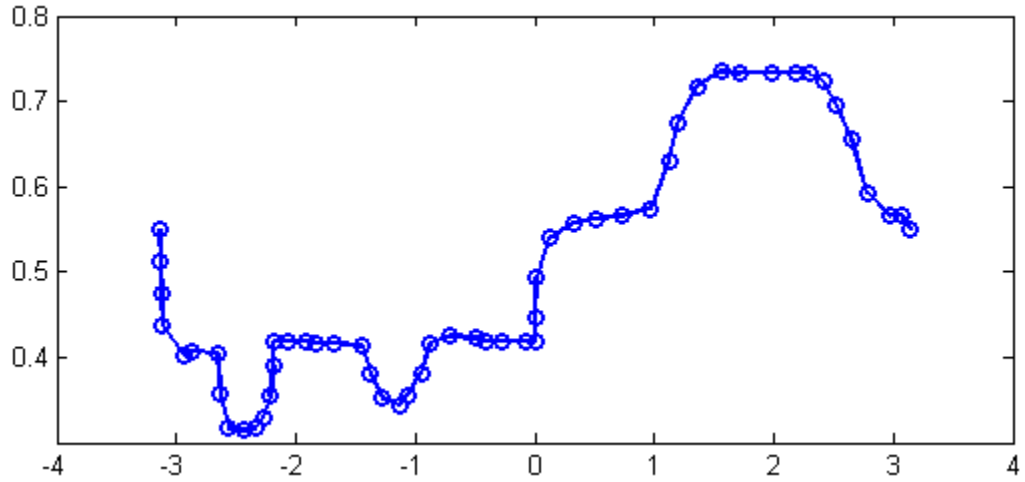


(x,y)

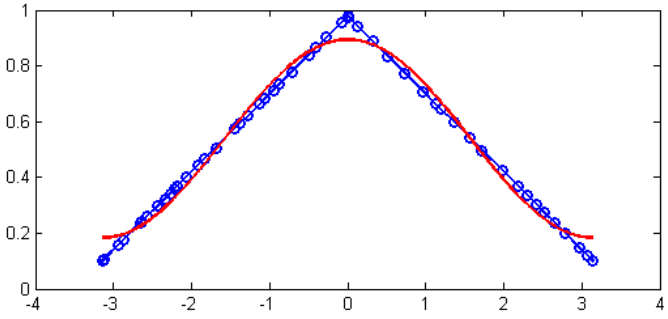
x(t)

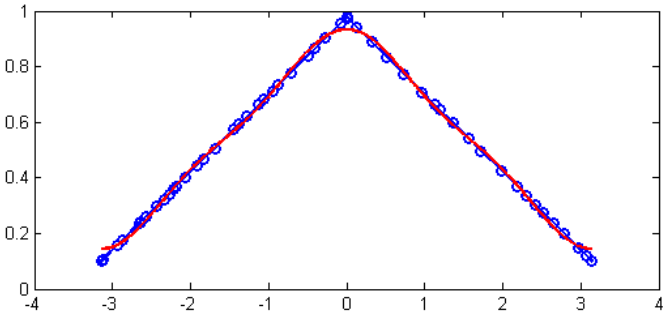


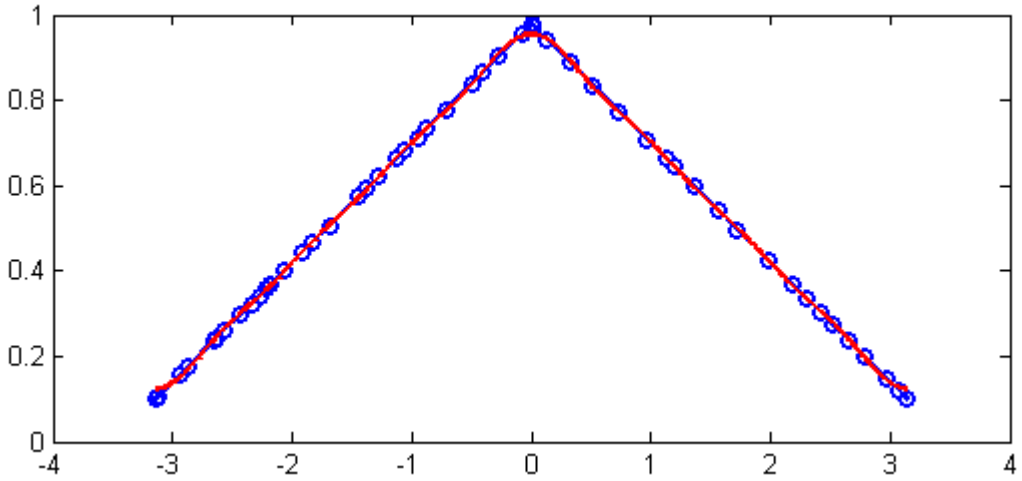
y(t)



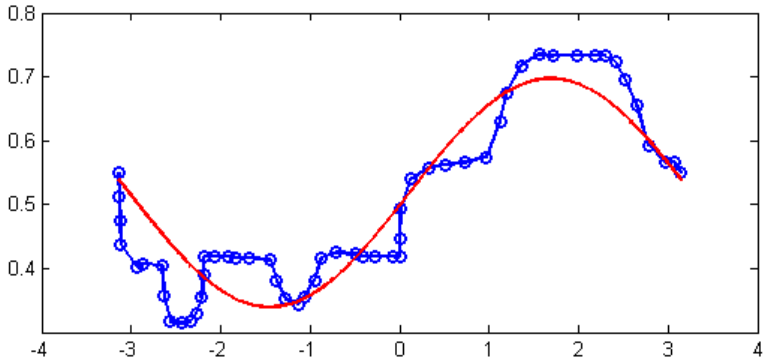
Közelítsük x(t)-t!

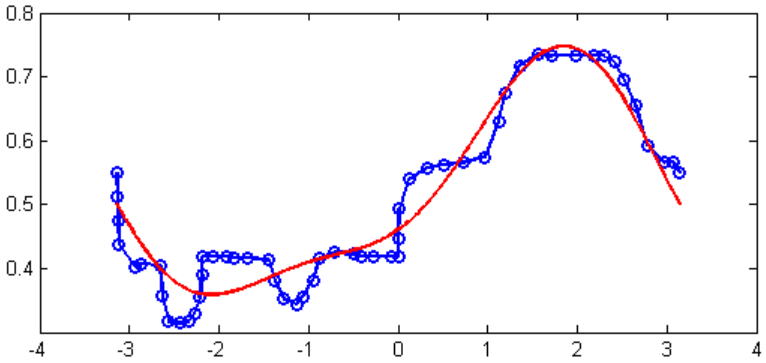


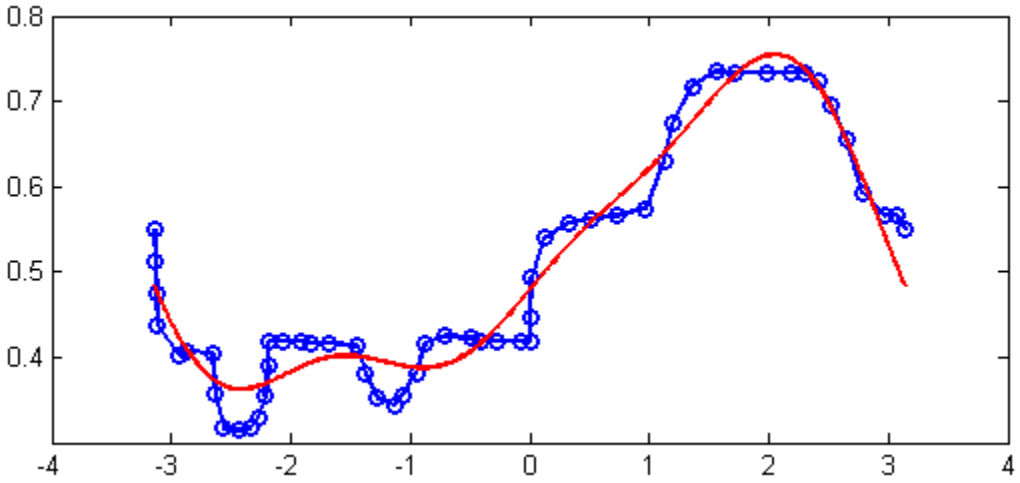




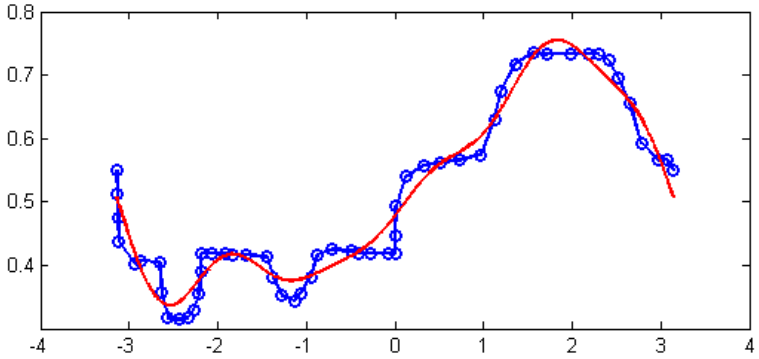
Közelítsük y(t)-t!

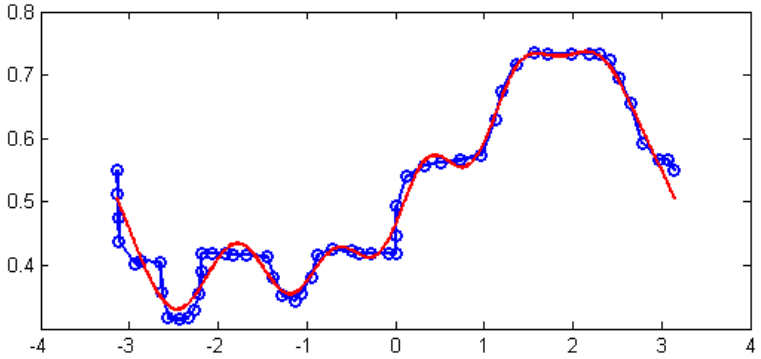


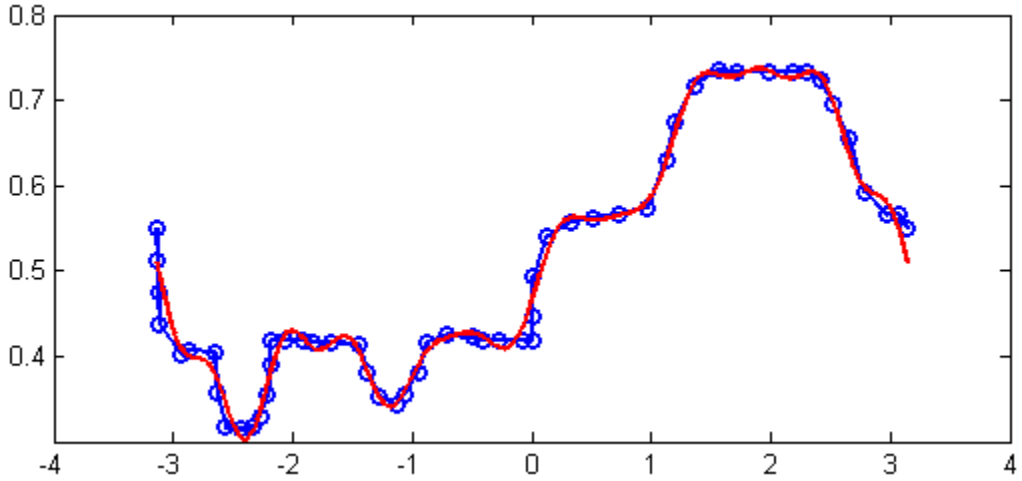




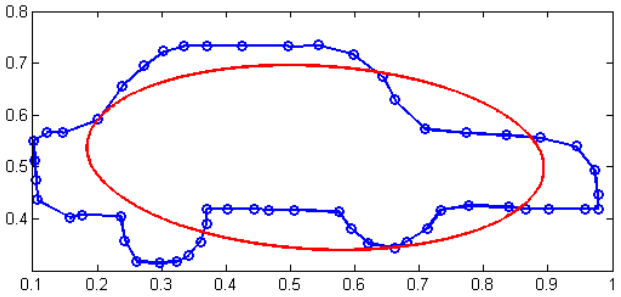
Közelítsük y(t)-t!

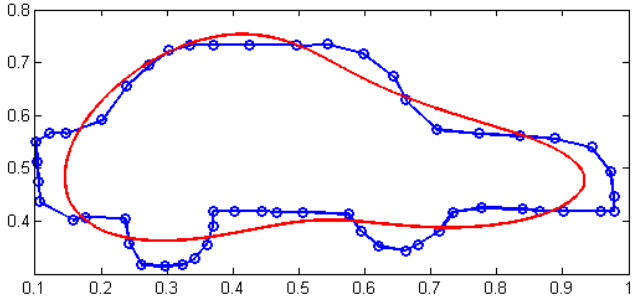


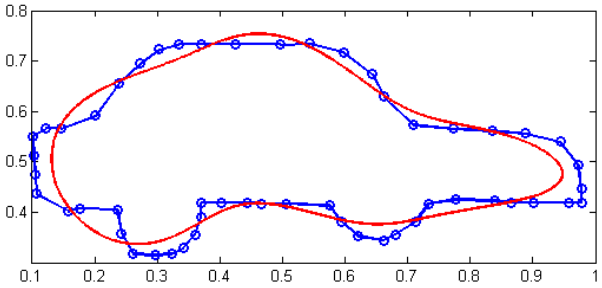


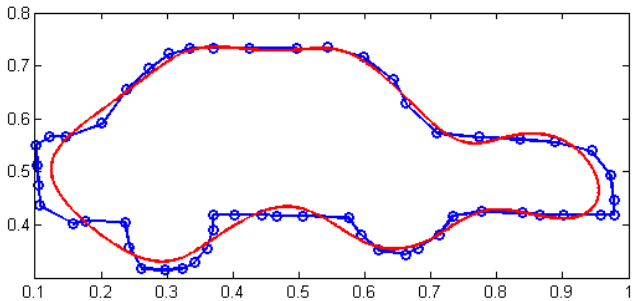


Kombináljuk a kettőt!

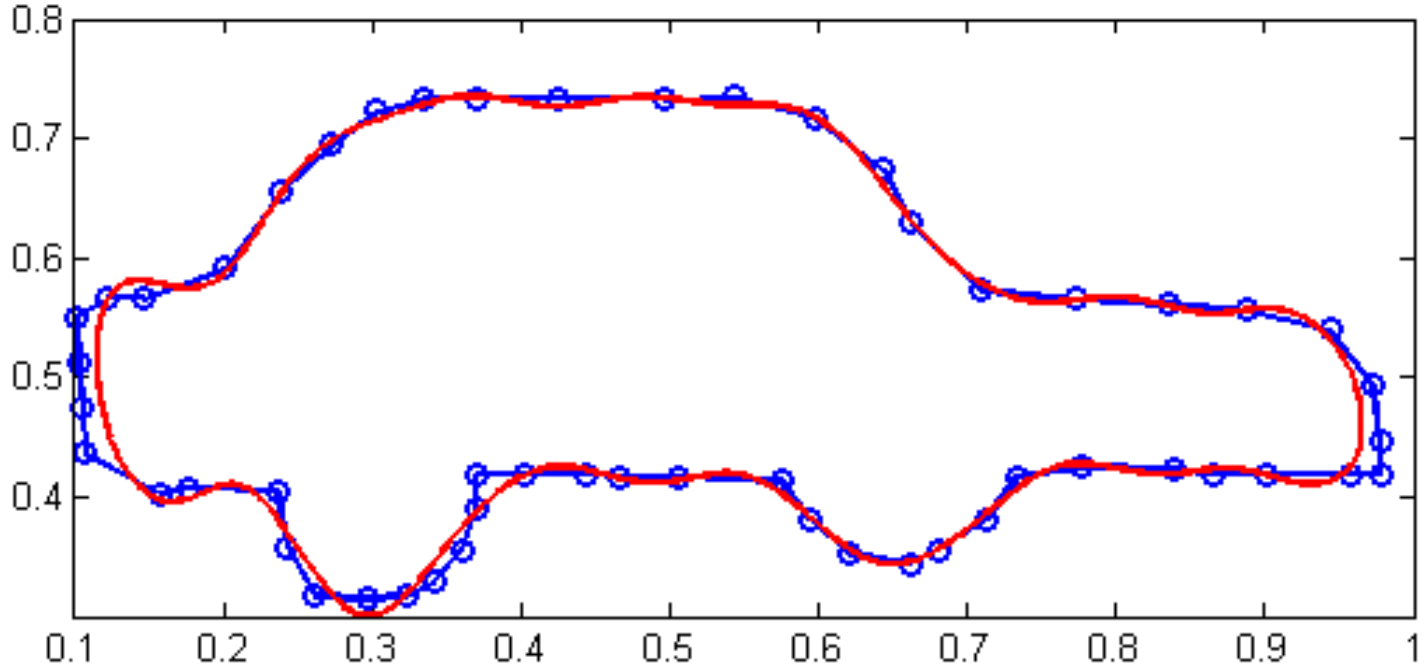








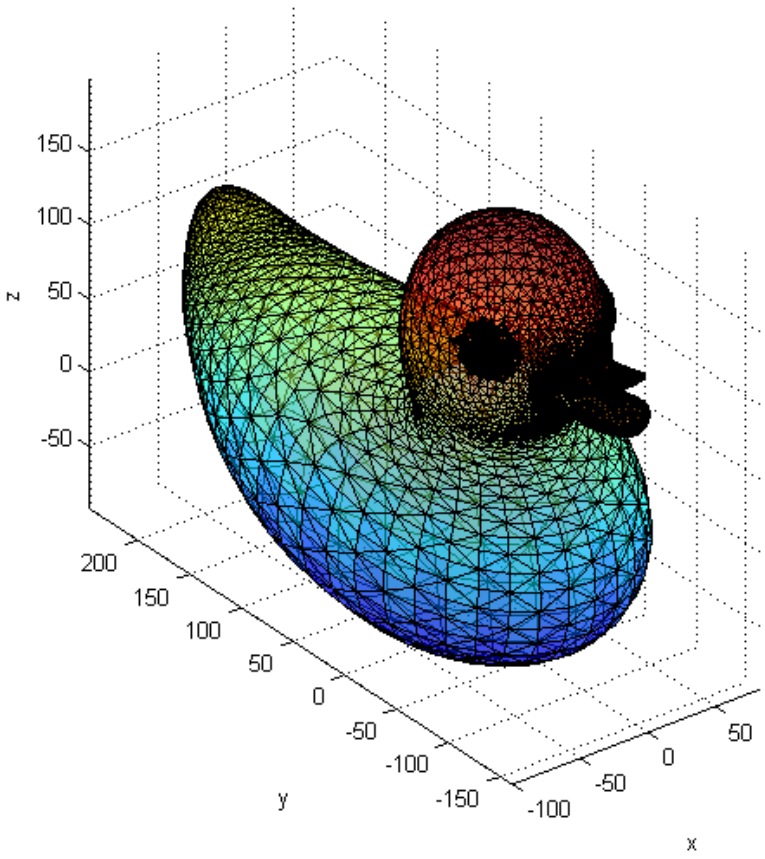
Eredmény



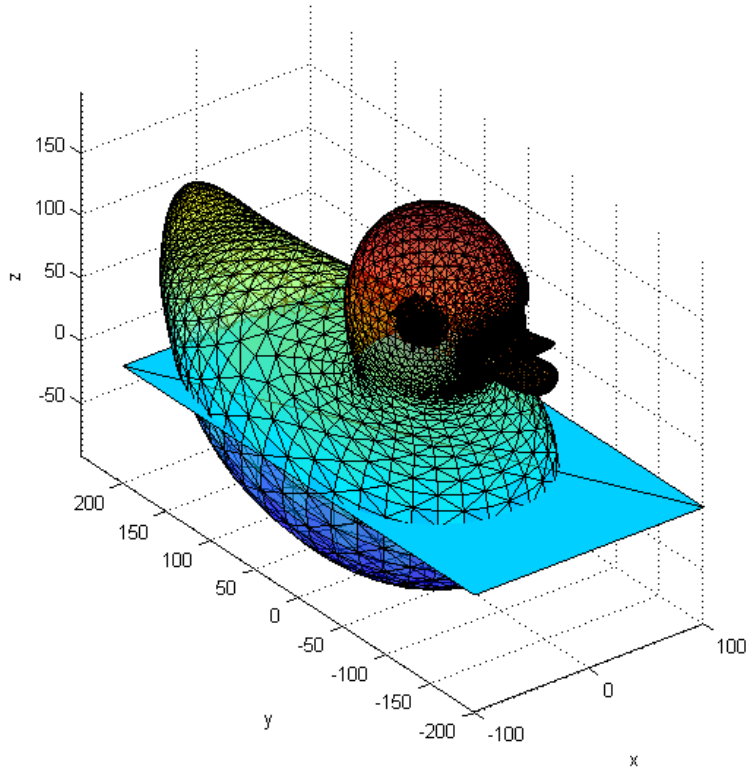
Tömörítés: **58** csúcspont helyett $2 \cdot 15$ együttható!

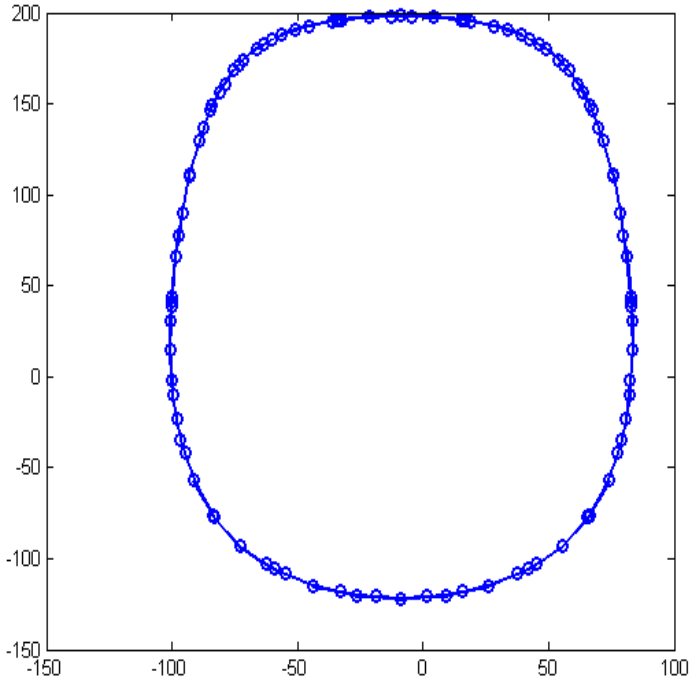
Mi a helyzet 3D-ben?

- Testmodell:
  - Csúcspontok
  - Háromszögek

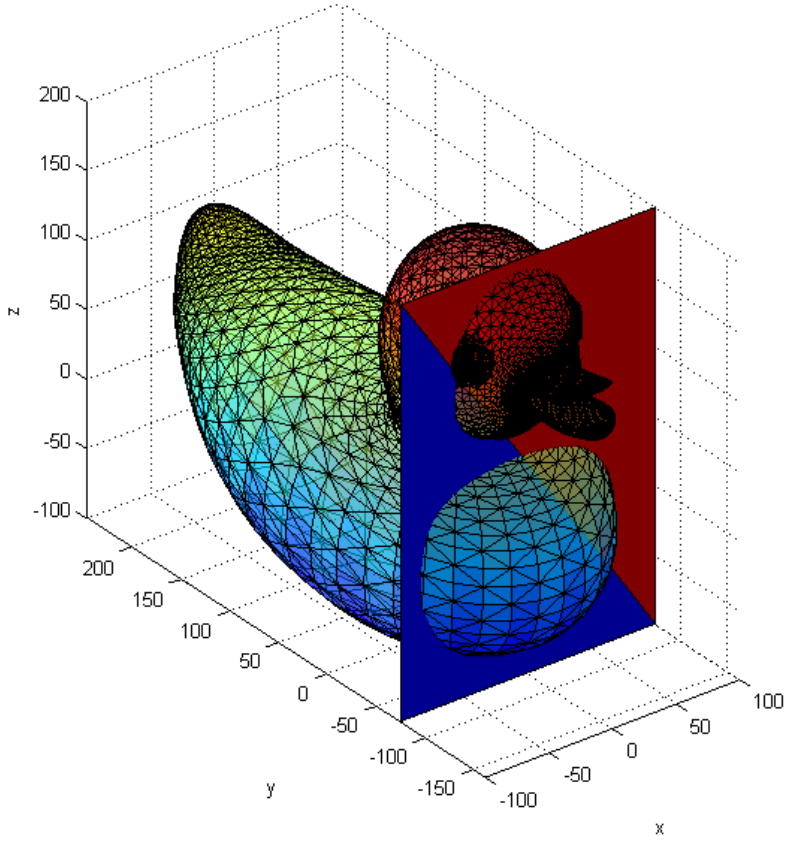


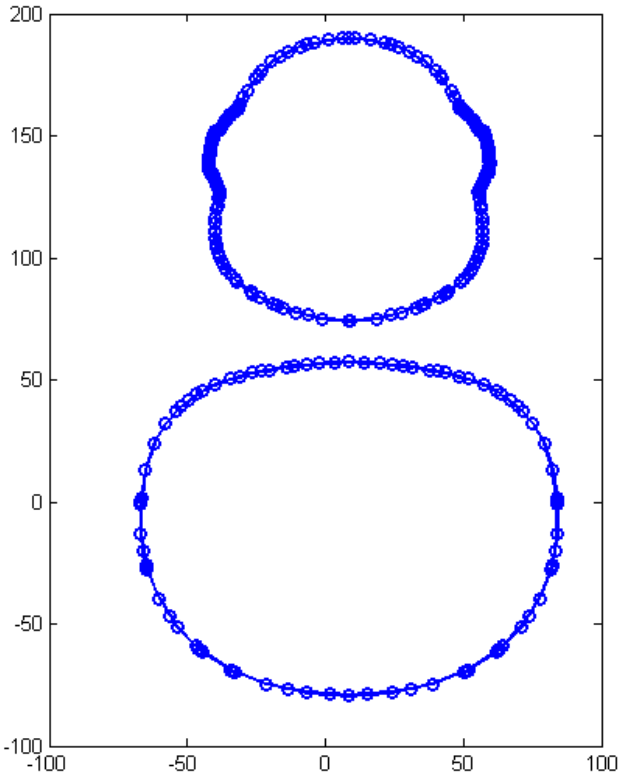
Keresztmetszet



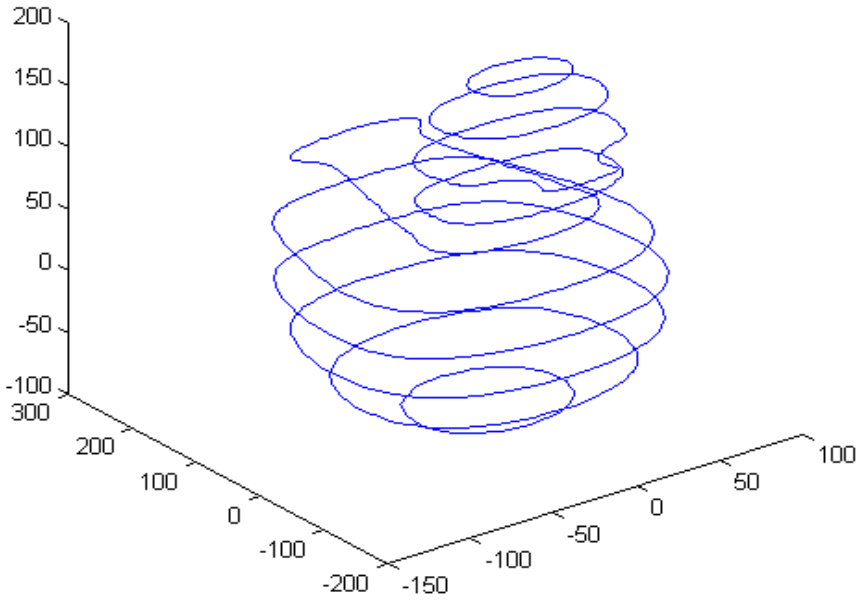


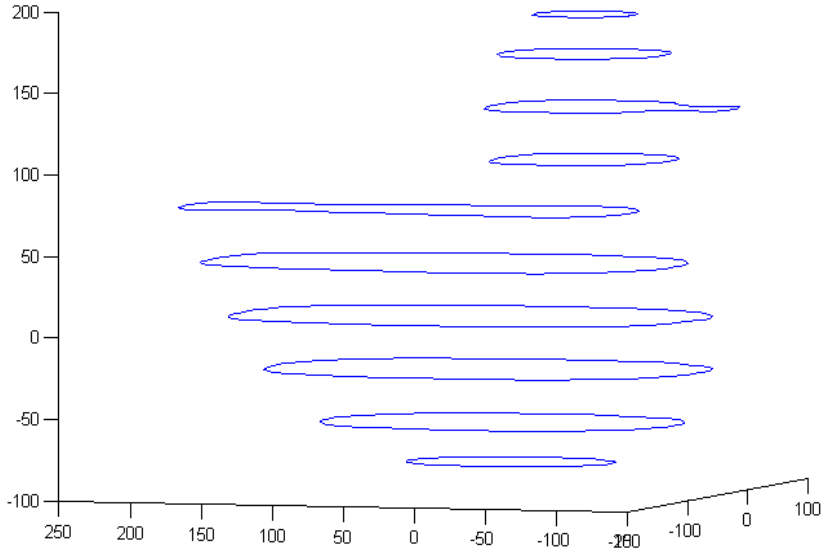
Keresztmetszet



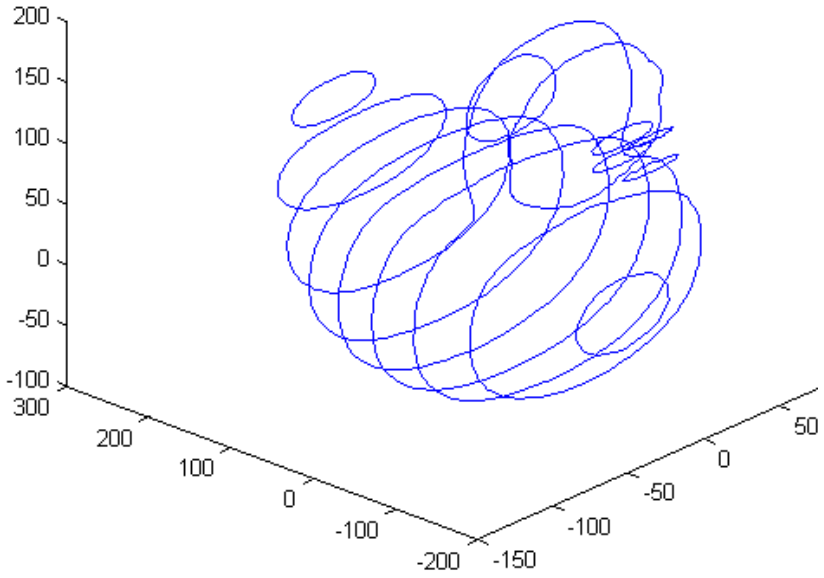


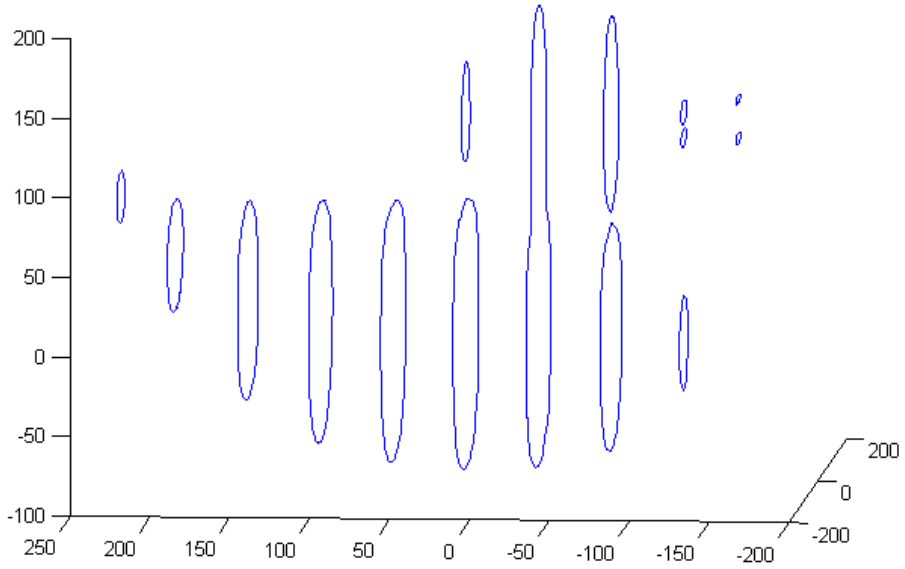
10 szelet XZ síkkal



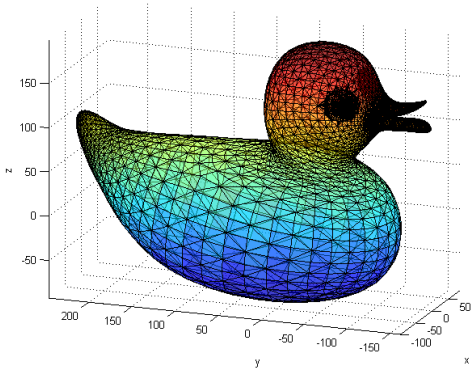


10 szelet XY síkkal





10-10 szelet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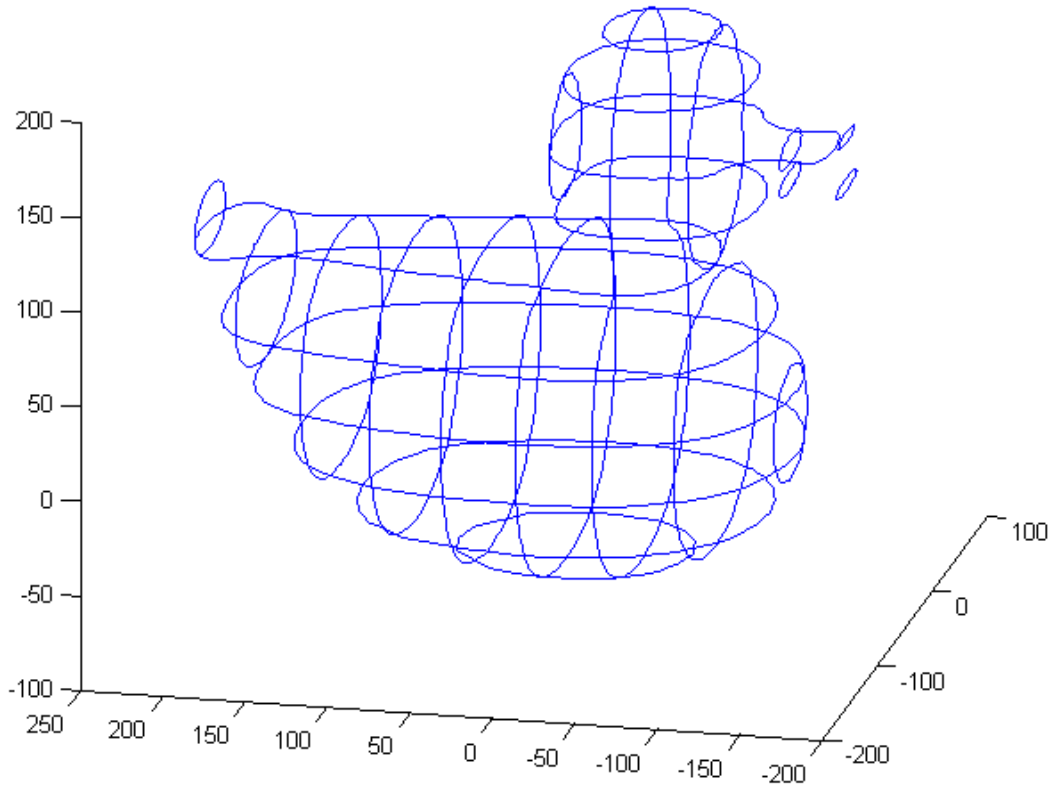
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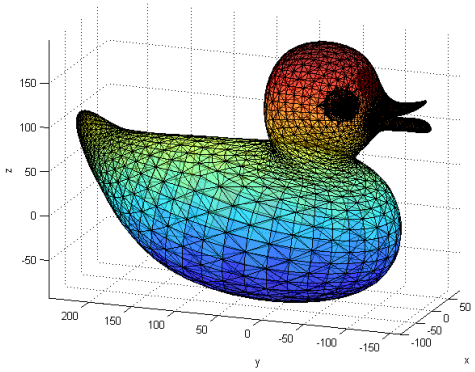
-200

30-30 szelet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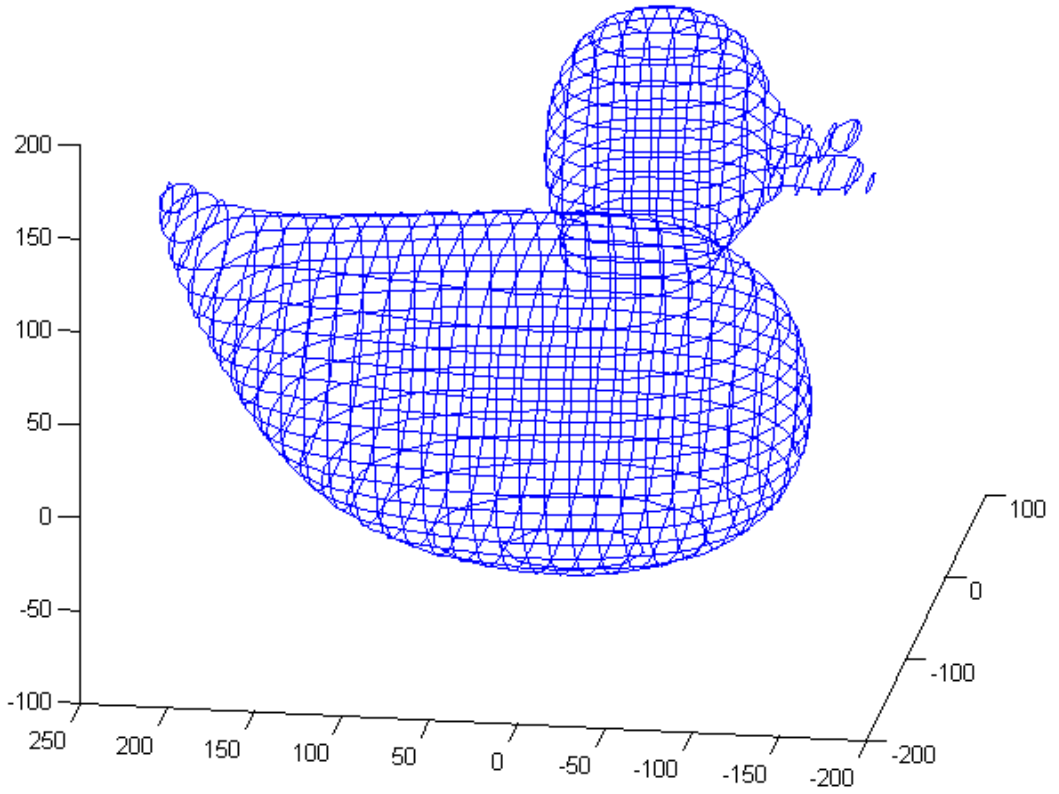
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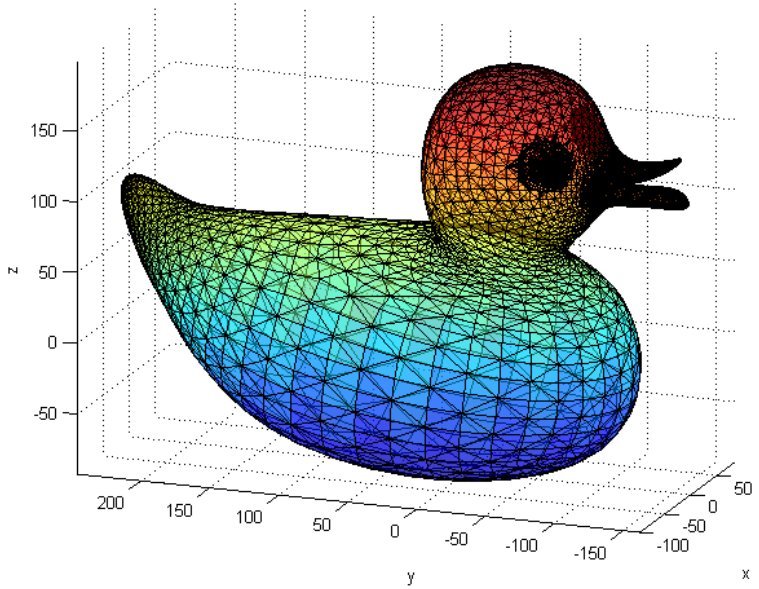
-100
-200

Számok

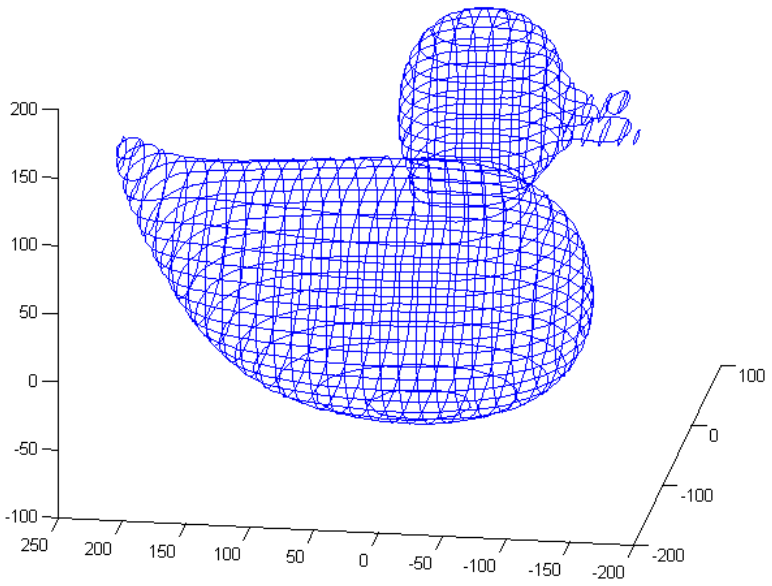
- 6390 3D pont (pontonként 3 adat)
- 12776 háromszög (háromszögenként 3 adat)
- Összesen: 57498 adat



Számok

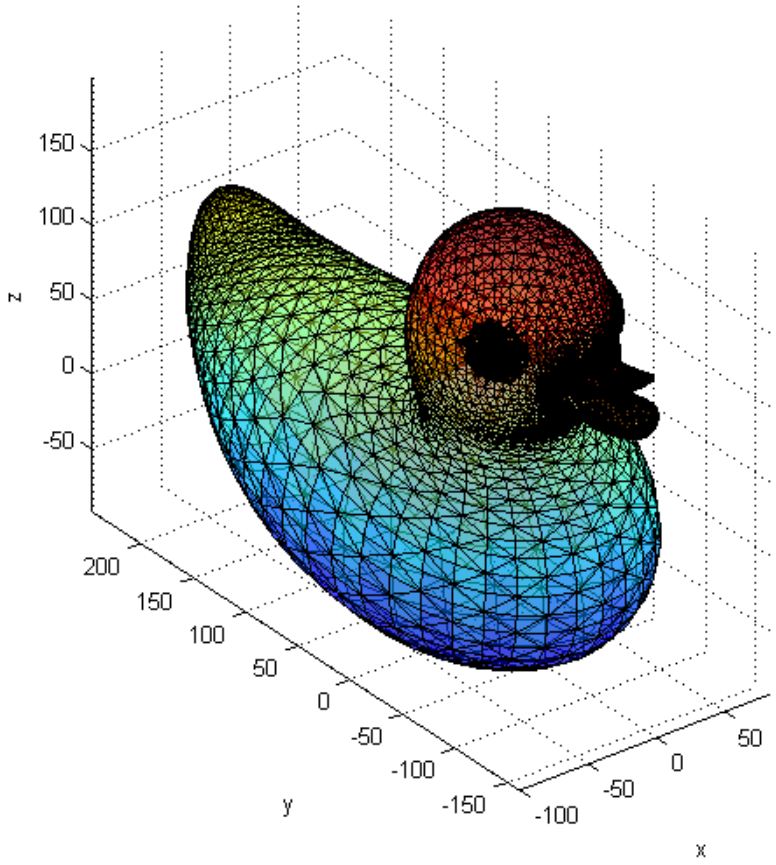
- 30+30 szelet (legalább 60 élhurok)
- 72 élhurok (élhurkonként $2 \cdot 15$ sin, $2 \cdot 15$ cos együttható)
- Összesen:
- $72 \cdot 2 \cdot 2 \cdot 15 = 4320$ adat

- Tömörítés: 4320/57498=0,07513
- Azaz 7,5%



Összefoglalás

- 3D alakzatokból 2D keresztmetszetek
- 2D keresztmetszetekből 2D élhurkok
- 2D élhurkokból 1D paraméterezések
- 1D közelítés

- Alkalmazások:
  - Közelítés
  - Simítás
  - Tömörítés
  - ...

Köszönöm a figyelmet!