



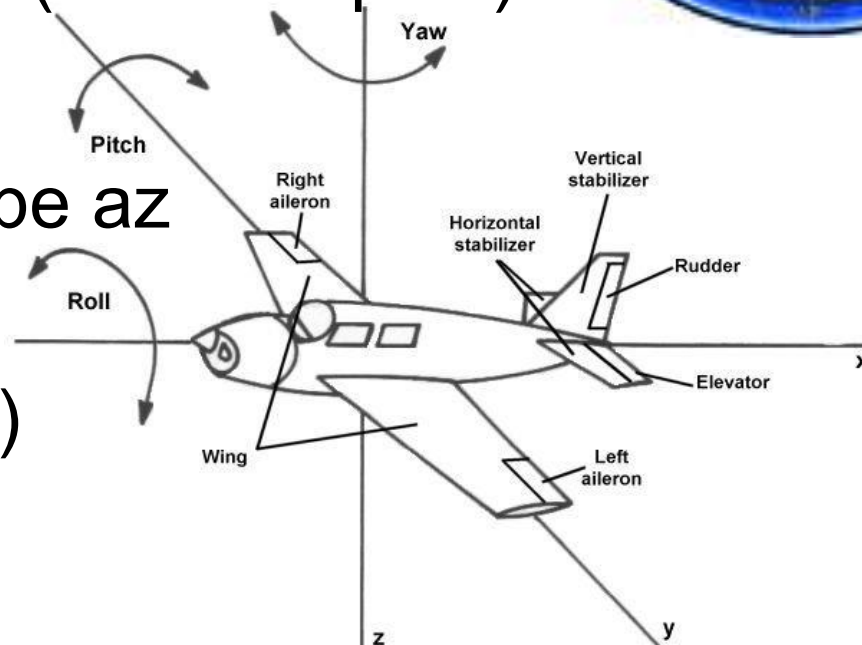
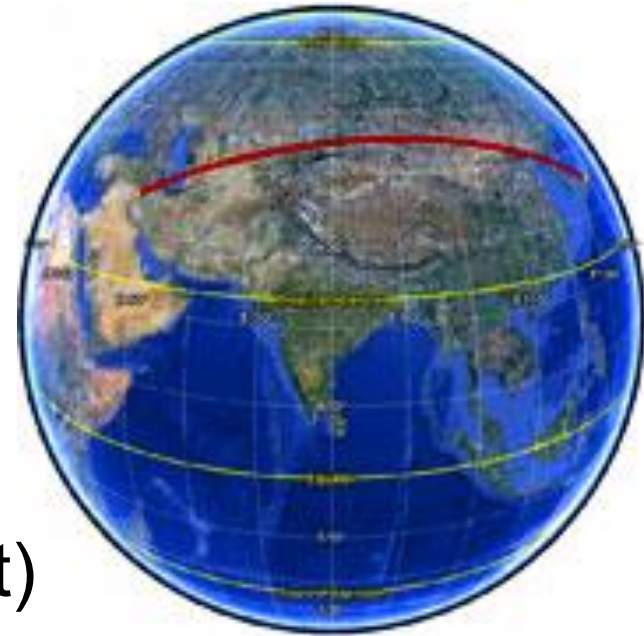
Robotrepülőgépek útvonaltervezése

Intelligens Rendszerek
Gyakorlat



Navigáció

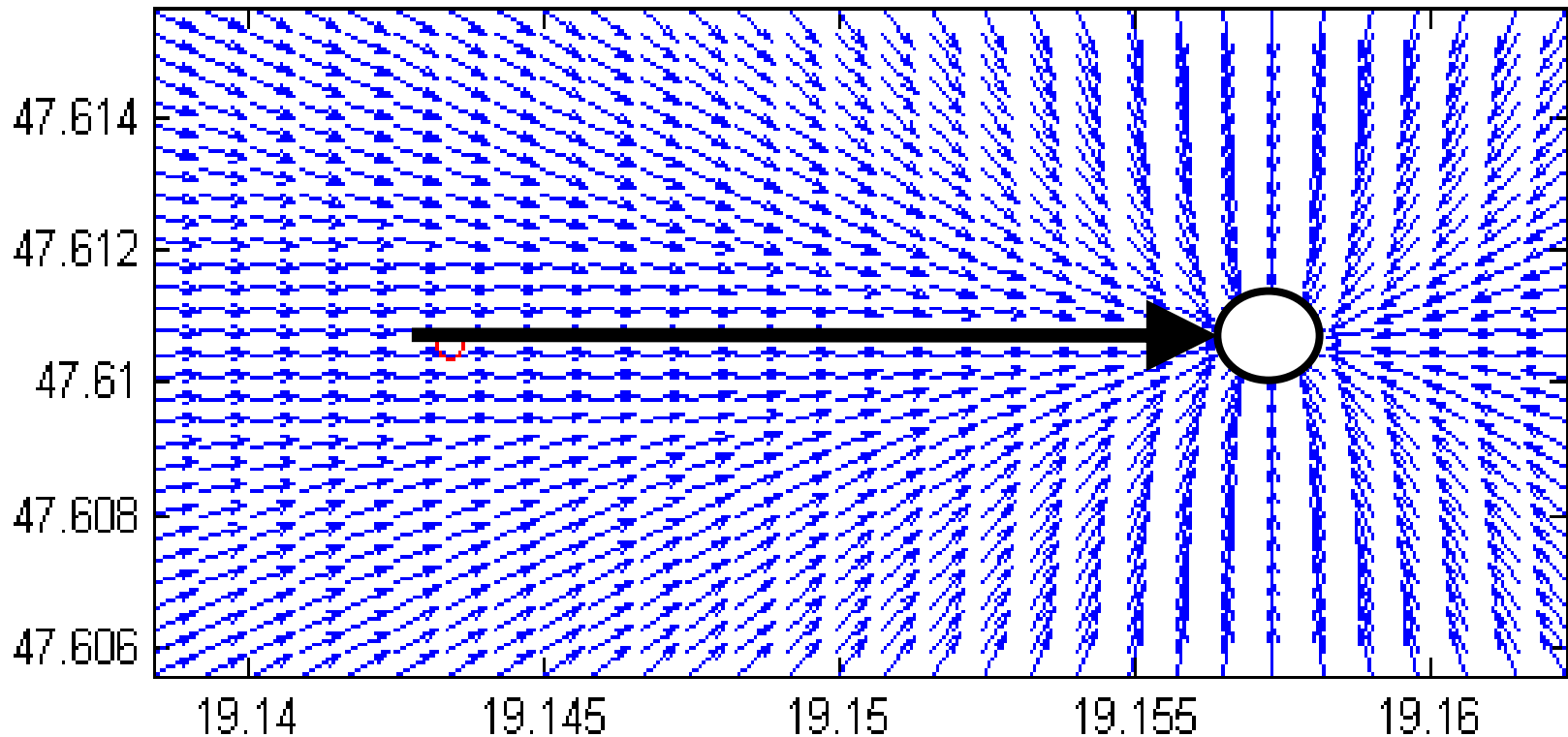
- Course
 - Tervezett útvonal
- Bearing
 - Haladási irány (É-hoz képest)
- Heading
 - A gép orra ebbe az irányba néz (É-hoz képest)





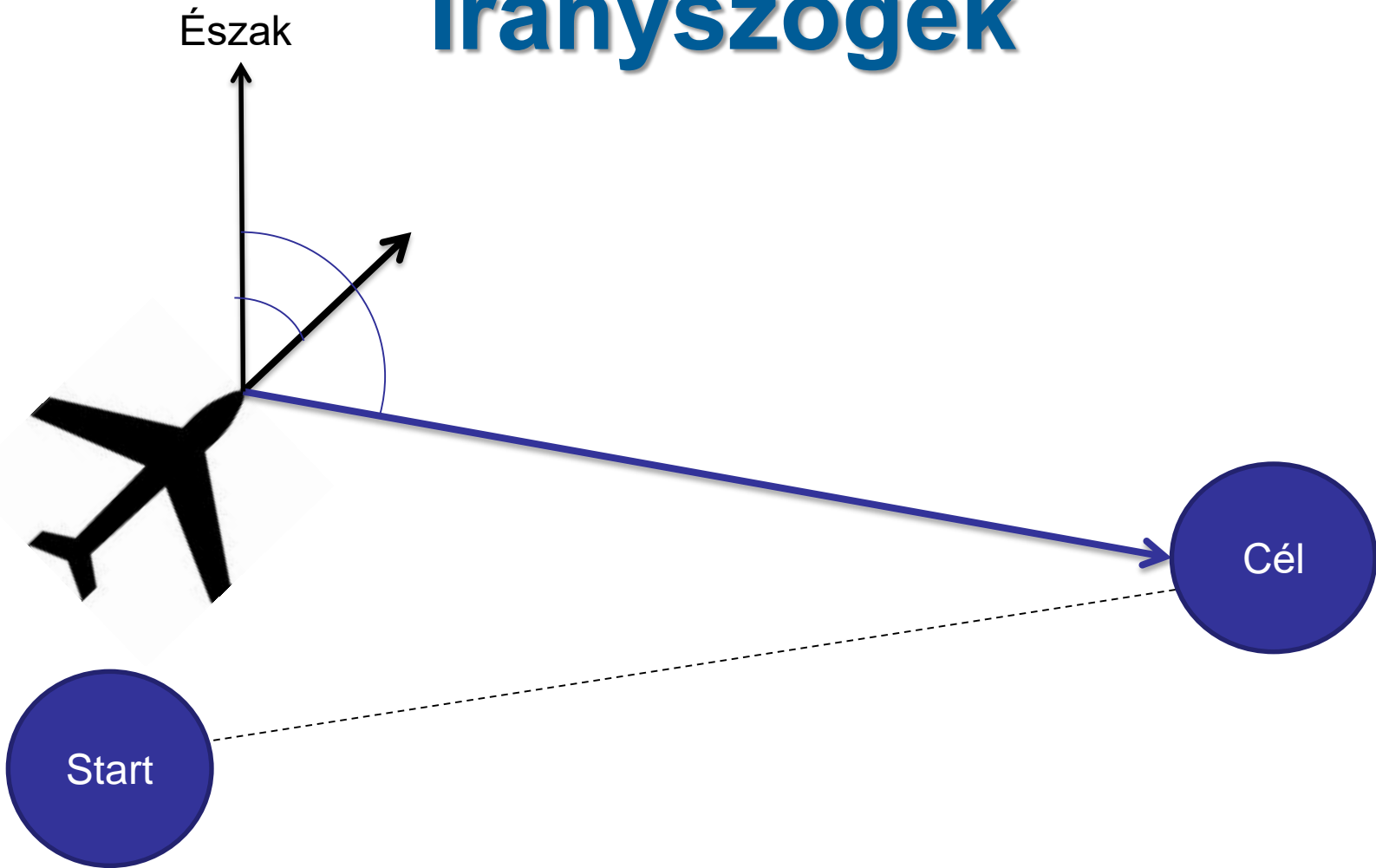
Fordulópontok

- A gép mindig egy koordináta párból álló pozíció felé halad





Írányszögek

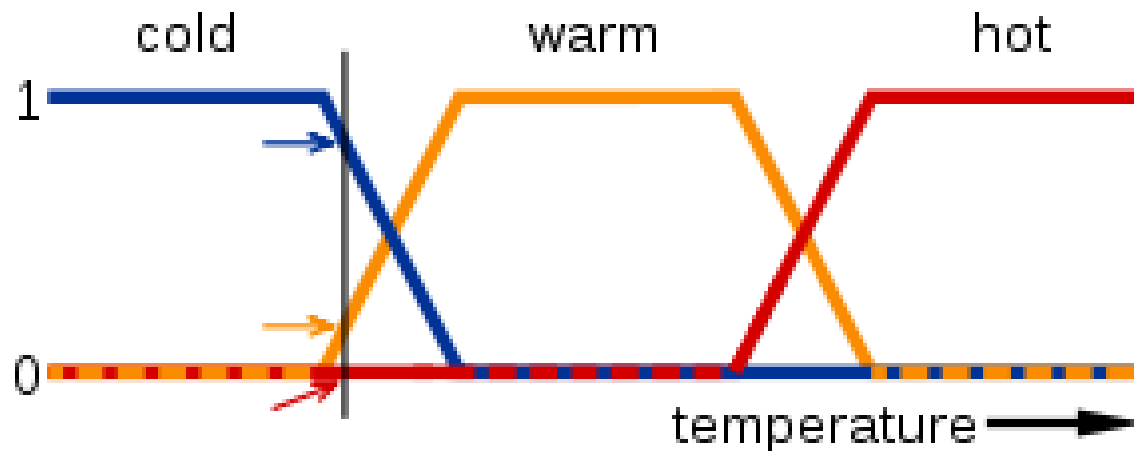


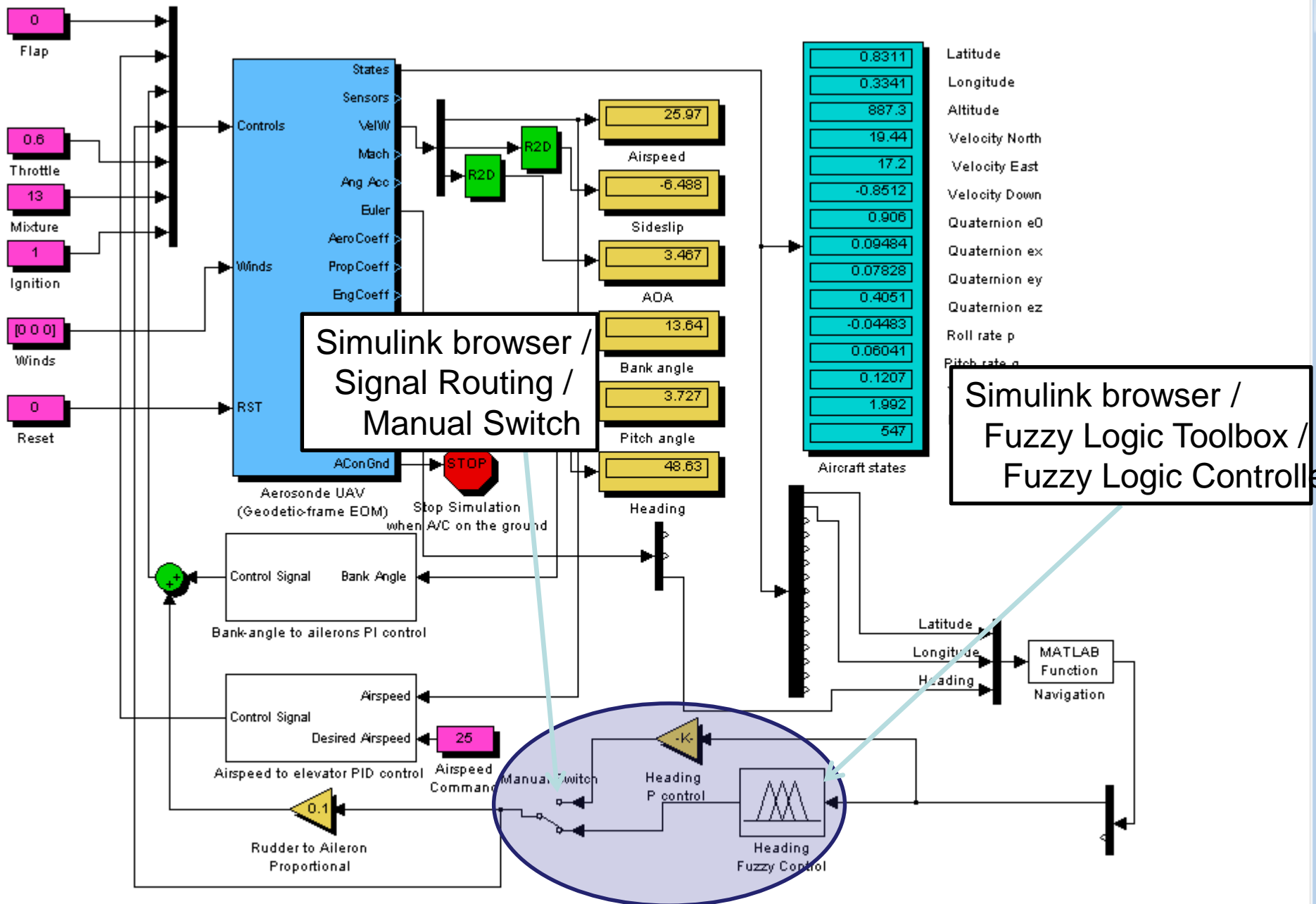
(Szöghiba: $-pi$ és $+pi$ között!)



Fuzzy logika: Mamdani szabályzó

- Átmenetes, nem határozott kijelentések



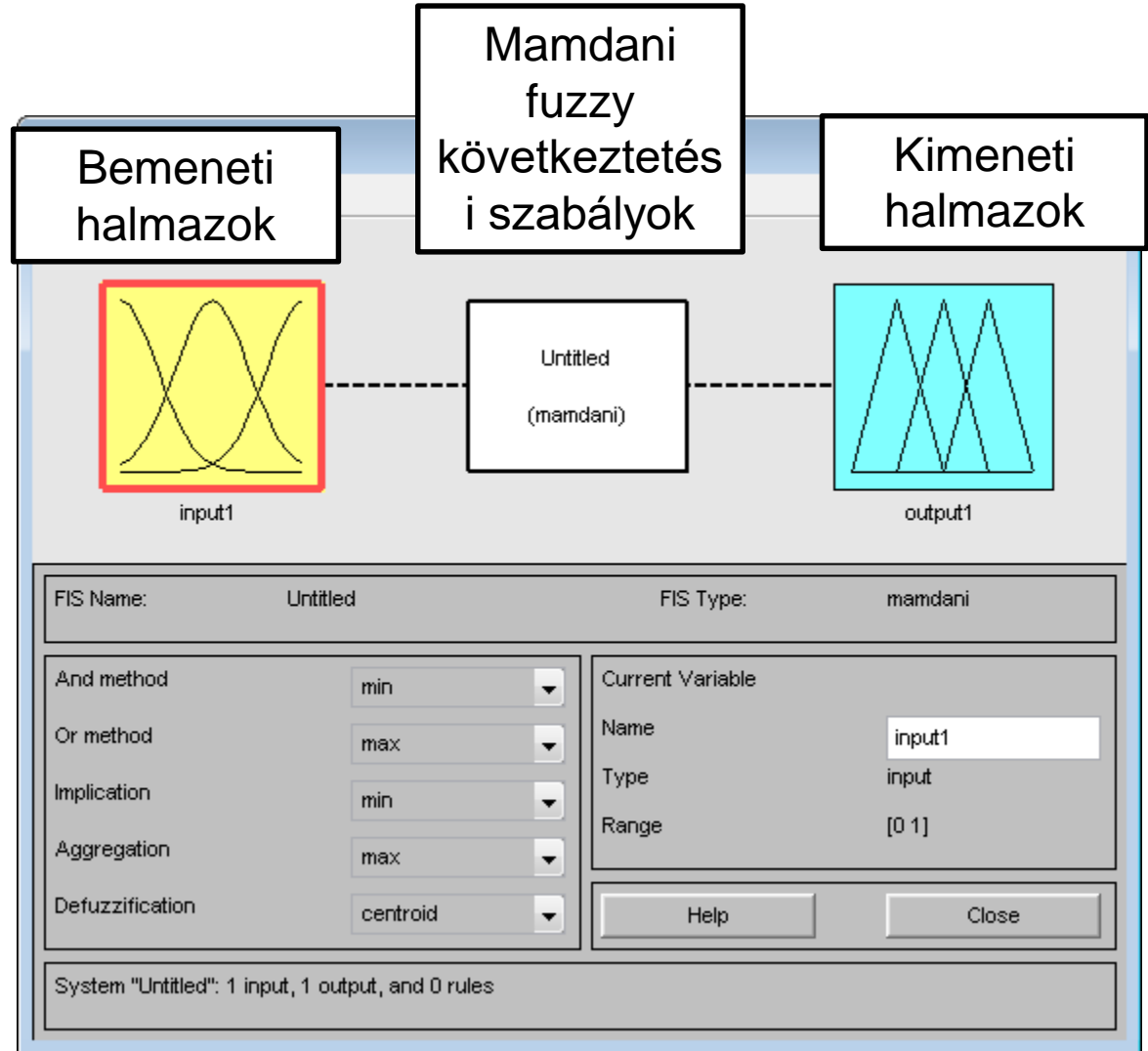




Fuzzy Toolbox

- Konzolban:
„fuzzy”
utasítás

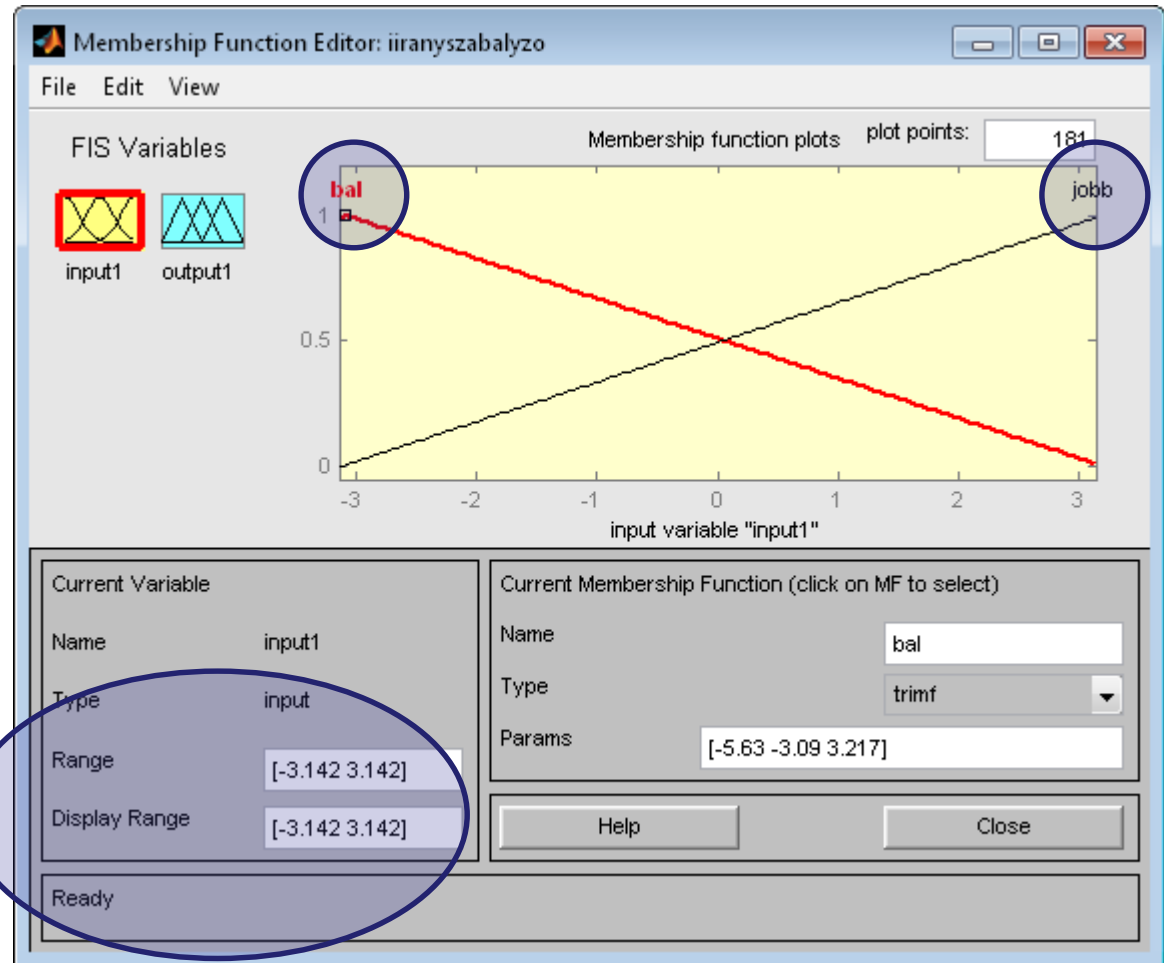
Fuzzy logikai
szabályok





Input

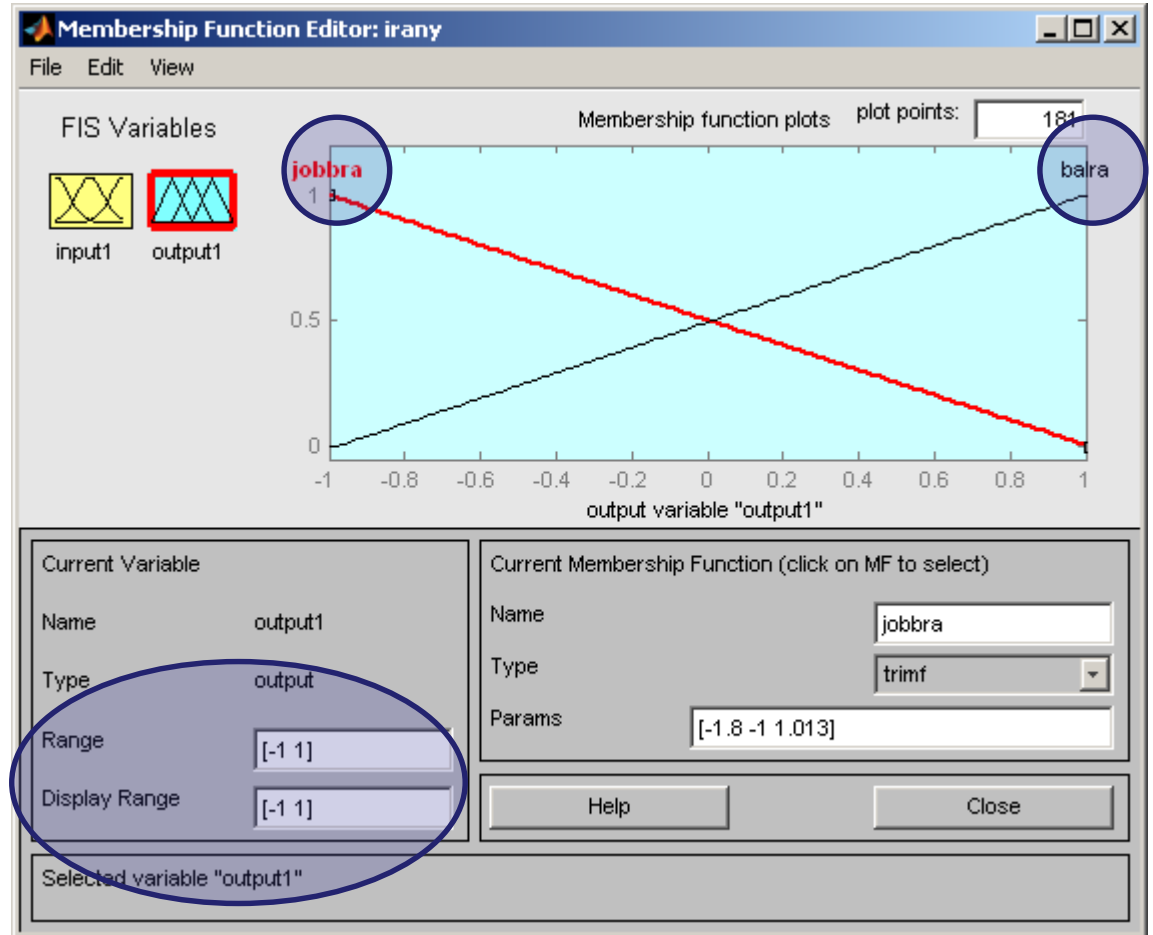
• -pi ... pi





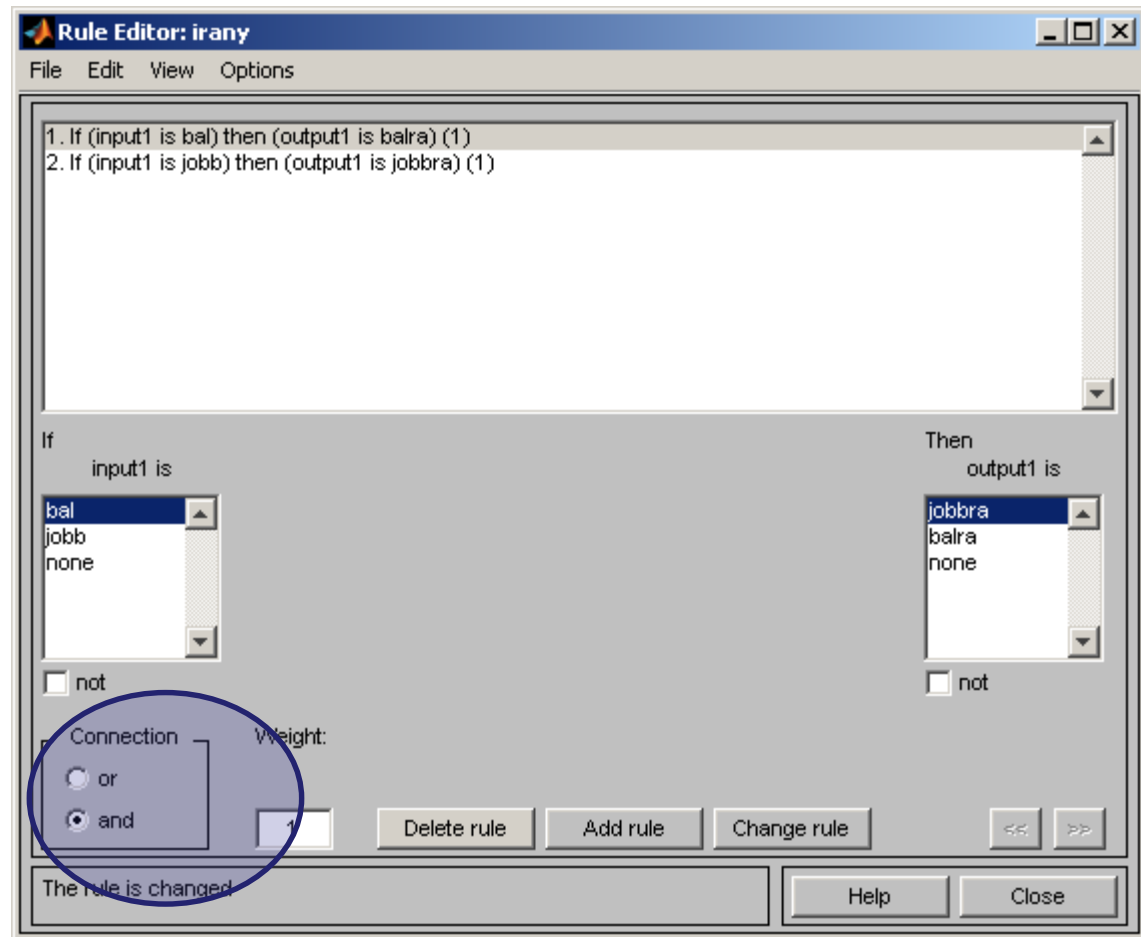
Output

• -1 ... 1





Mamdani control





Mamdani control

The image shows two software windows. The 'FIS Editor: Untitled' window on the left displays a graph with two overlapping bell-shaped curves on a yellow background, labeled 'input1'. Below the graph is a configuration table:

FIS Name:	Untitled
And method	min
Or method	max
Implication	min
Aggregation	max
Defuzzification	centroid

The 'Rule Editor: irany' window on the right shows a list of rules:

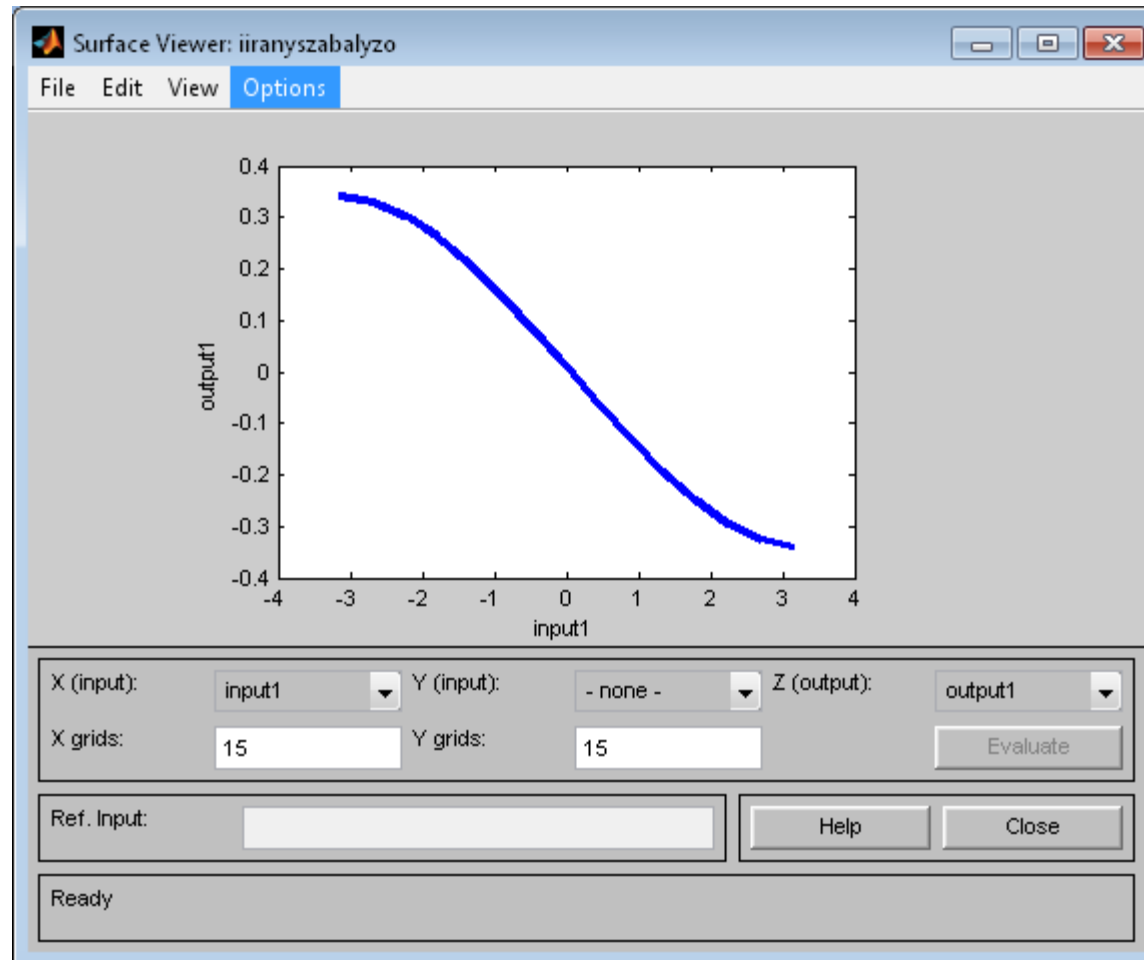
1. If (input1 is bal) then (output1 is balra) (1)
2. If (input1 is jobb) then (output1 is jobbra) (1)

Below the rules, the 'If' section is set to 'input1 is' with a dropdown menu showing 'bal', 'jobb', and 'none'. The 'Then' section is set to 'output1 is' with a dropdown menu showing 'jobbra', 'balra', and 'none'. A 'Connection' dialog box is open, showing 'or' and 'and' options, with 'and' selected. The 'Weight' field is set to 1. Buttons for 'Delete rule', 'Add rule', and 'Change rule' are visible. A status bar at the bottom indicates 'The rule is changed'.

System "Untitled": 1 input, 1 output, and 0 rules



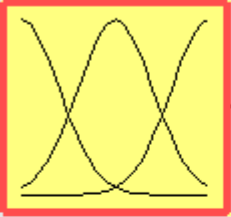
View / surface





View / rules

FIS Editor: Untitled
File Edit View



input1

Untitled
(mamdani)

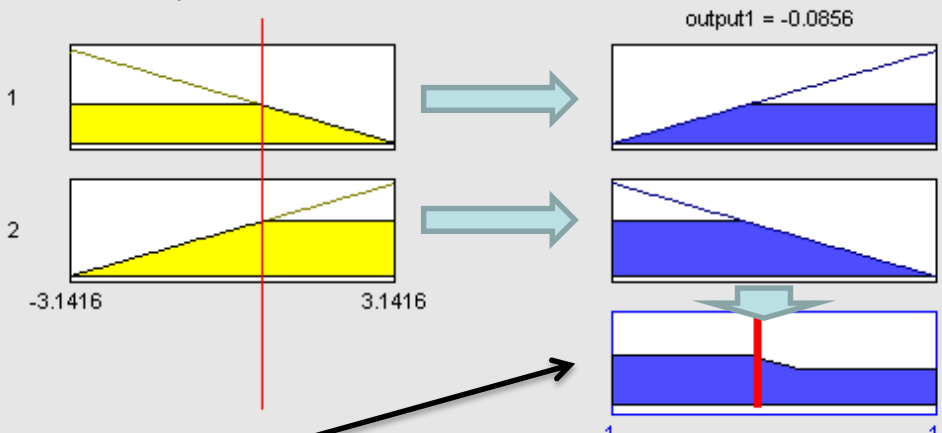
FIS Name: Untitled

And method: min
Or method: max
Implication: min
Aggregation: max
Defuzzification: centroid

System "Untitled": 1 input, 1 output, and 0 rules

Rule Viewer: iranyyszabalyzo
File Edit View Options

input1 = 0.594



output1 = -0.0856

Input: 0.5938 Plot points: 101 Move: left right down up

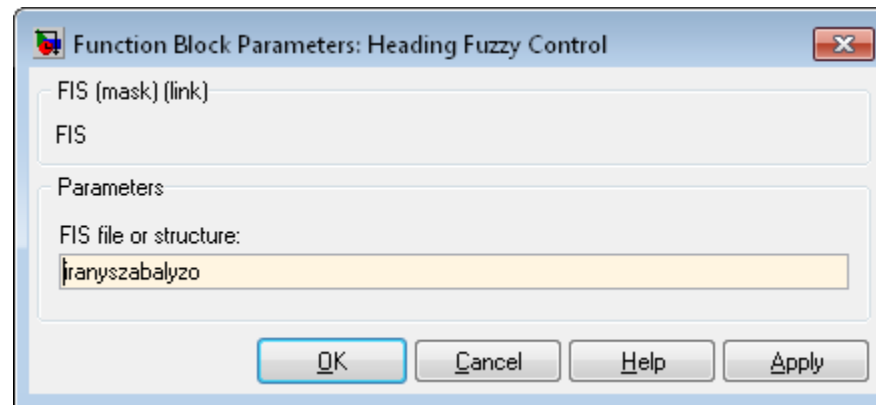
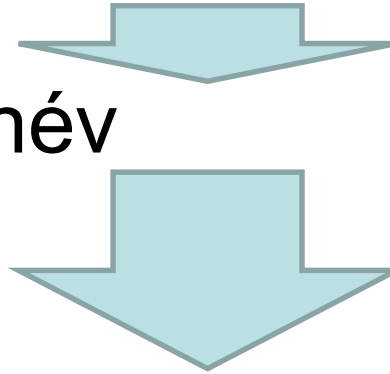
Opened system iranyyszabalyzo, 2 rules

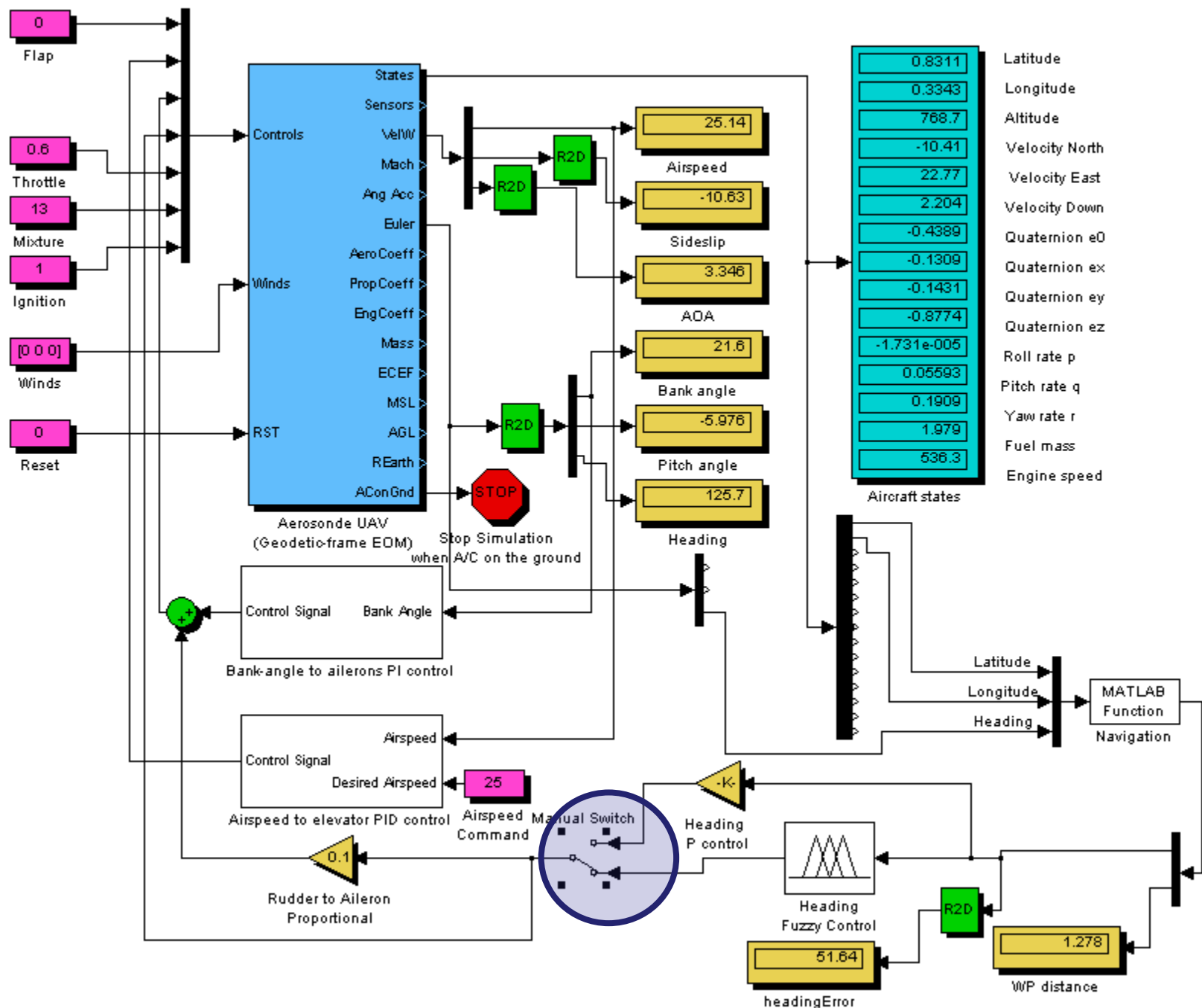
Help Close



File / export / to workspace

- „irany szabalyzo” név







Inicializálás (init.m)

```
1 %INIT
2 %!!!!!! RUN THIS FIRST !!!!!
3 clear all;
4 close all;
5
6 global target_waypoint
7 target_waypoint=2; %Cél fordulópont sorszáma
8
9 global lat;
10 global lon;
11 lat=1;
12 lon=2;
13
14 %Dunakeszi reptér 4 * (kb)1000m
15 global waypoint_list
16 waypoint_list=[
17     47.6206, 19.1434; %1. fordulópont 'Decimal Degree' formátumban
18     47.6206, 19.1573; %2. fordulópont 'Decimal Degree' formátumban
19     47.6092, 19.1573; %3. fordulópont 'Decimal Degree' formátumban
20     47.6092, 19.1434 ];%4. fordulópont 'Decimal Degree' formátumban
21 waypoint_list=deg2rad(waypoint_list)
22 %1-től számoz, nem nullától!!!
23 %waypoint_list(1,lat) : 47.6206
24 %waypoint_list(1,lon) : 19.1434
25
26 plotMap();
27
```

