

Aplicação de um modelo fuzzy em um sistema para classificação de perfis e inferência de atividades

Leonardo M. Silva

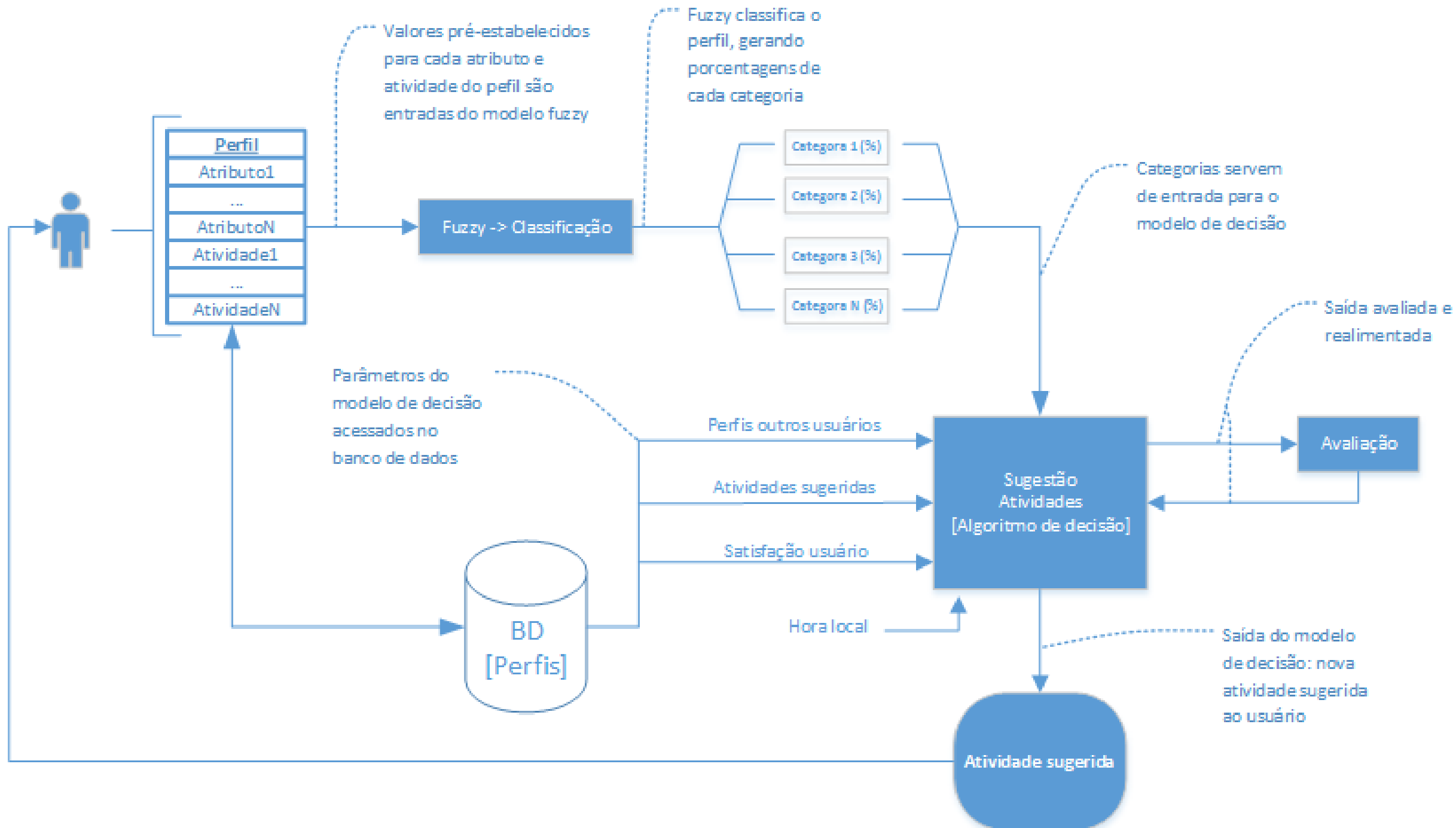
2016

Objetivo Geral

- Desenvolver um sistema inteligente capaz de classificar perfis de usuários baseado em seus dados pessoais e atividades cotidianas através de método fuzzy e sugerir, através de um algoritmo de tomada decisão, possíveis atividades relacionadas ao seu perfil.

Motivação

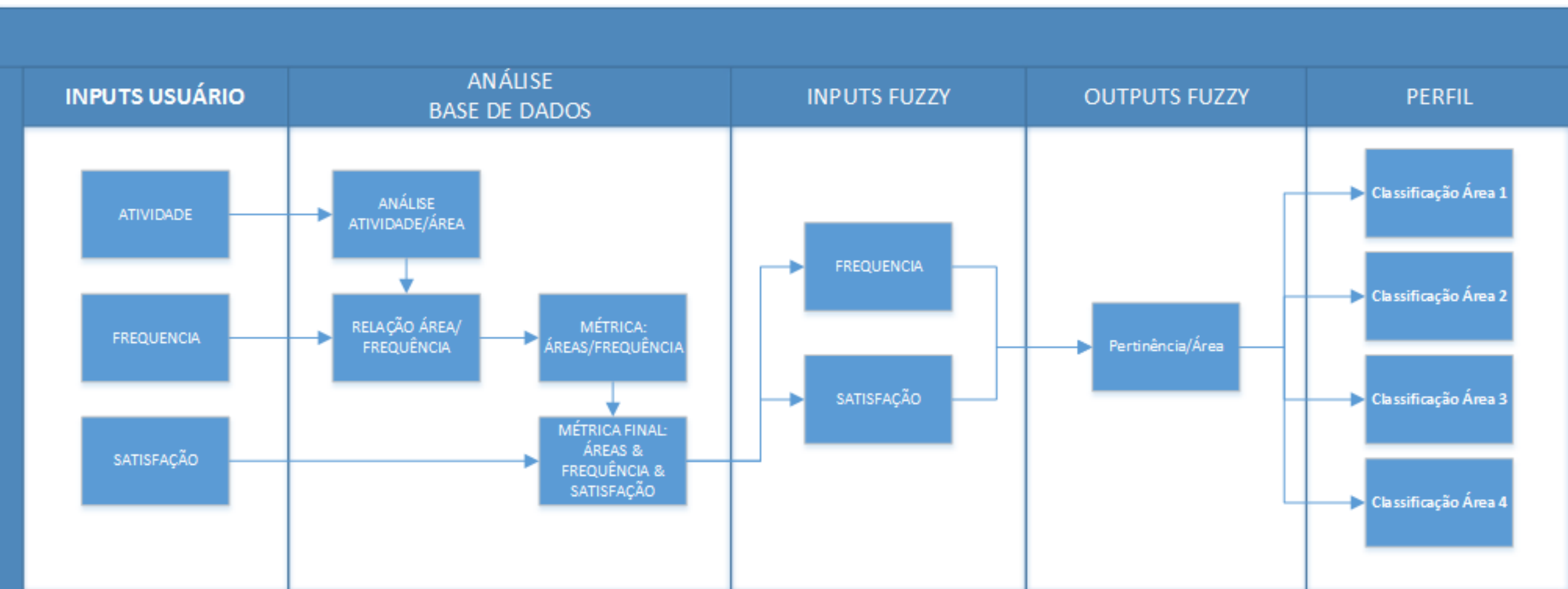
- OMS sobre o conceito de saúde: “estudo completo de bem estar físico, mental e social, e não simplesmente a ausência de doença ou enfermidade”.
- Qualidade de vida e bem estar são conceitos complexos e subjetivos, porém, estão intrinsicamente ligados a felicidade e boas experiências vividas dentro de um contexto socioeconômico.



Macro áreas

Áreas			
Natureza e Saude (NS)	Humanas e Social (HS)	Educação e Conhecimento (EC)	Cultura e Criatividade (CC)

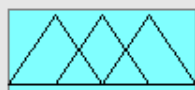
Primeira implementação



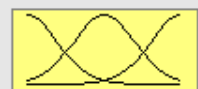
FIS Variables



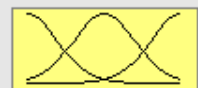
AREA



AREA



FREQ

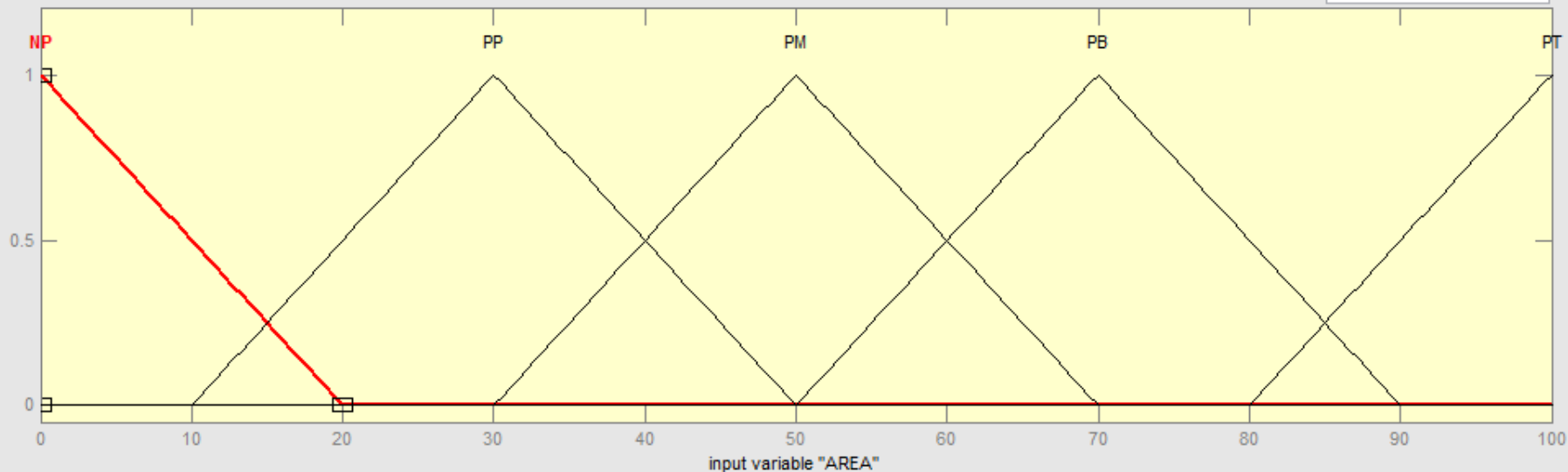


SATIS

plot points:

181

Membership function plots



Current Variable

Name AREA

Type input

Range [0 100]

Display Range [0 100]

Current Membership Function (click on MF to select)

Name NP

Type trimf

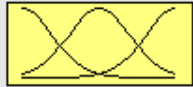
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Help

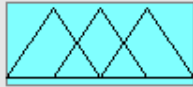
Close

Ready

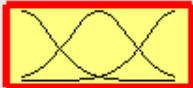
FIS Variables



AREA



AREA



FREQ

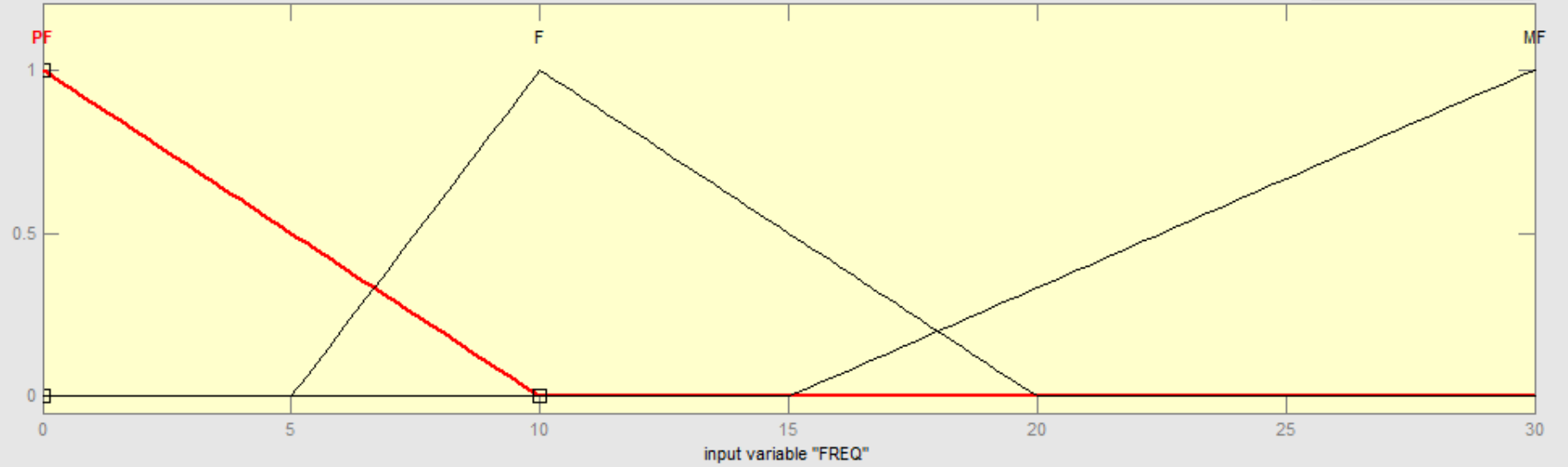


SATIS

plot points:

181

Membership function plots



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Display Range: [0 30]

Current Membership Function (click on MF to select)

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Type: trimf

Params: [0 0 10]

Help

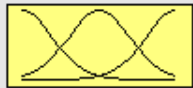
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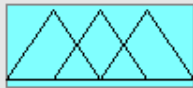
plot points:

181

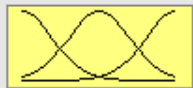
FIS Variables



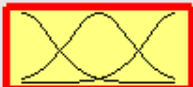
AREA



AREA

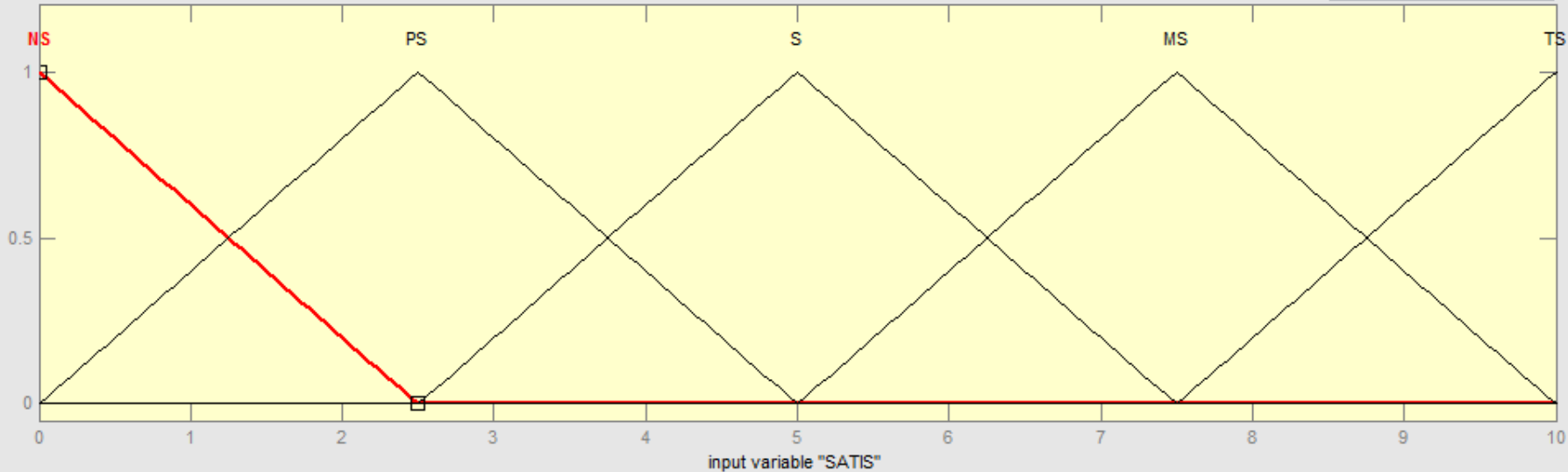


FREQ



SATIS

Membership function plots



Current Variable

Name

SATIS

Type

input

Range

[0 10]

Display Range

[0 10]

Current Membership Function (click on MF to select)

Name

NS

Type

trimf

Params

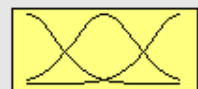
[-2.5 -2.776e-017 2.5]

Help

Close

Selected variable "SATIS"

FIS Variables



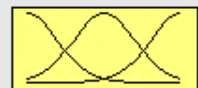
AREA



AREA



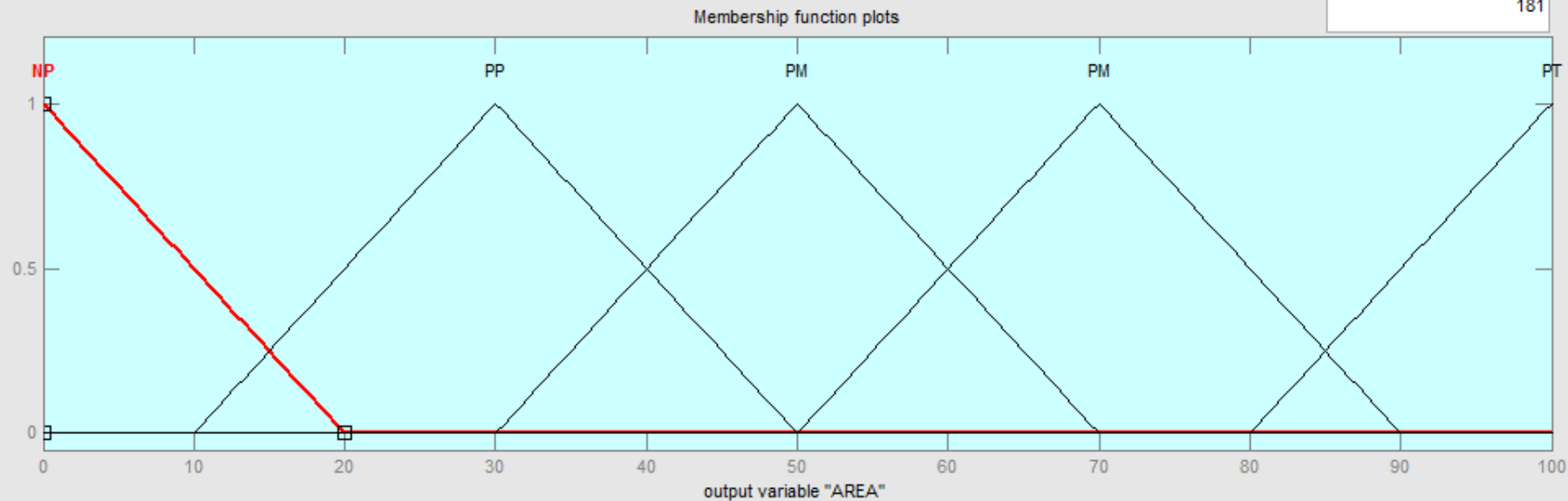
FREQ



SATIS

plot points:

181



Current Variable

Name AREA

Type output

Range [0 100]

Display Range [0 100]

Current Membership Function (click on MF to select)

Name NP

Type trimf

Params [0 0 20]

Help

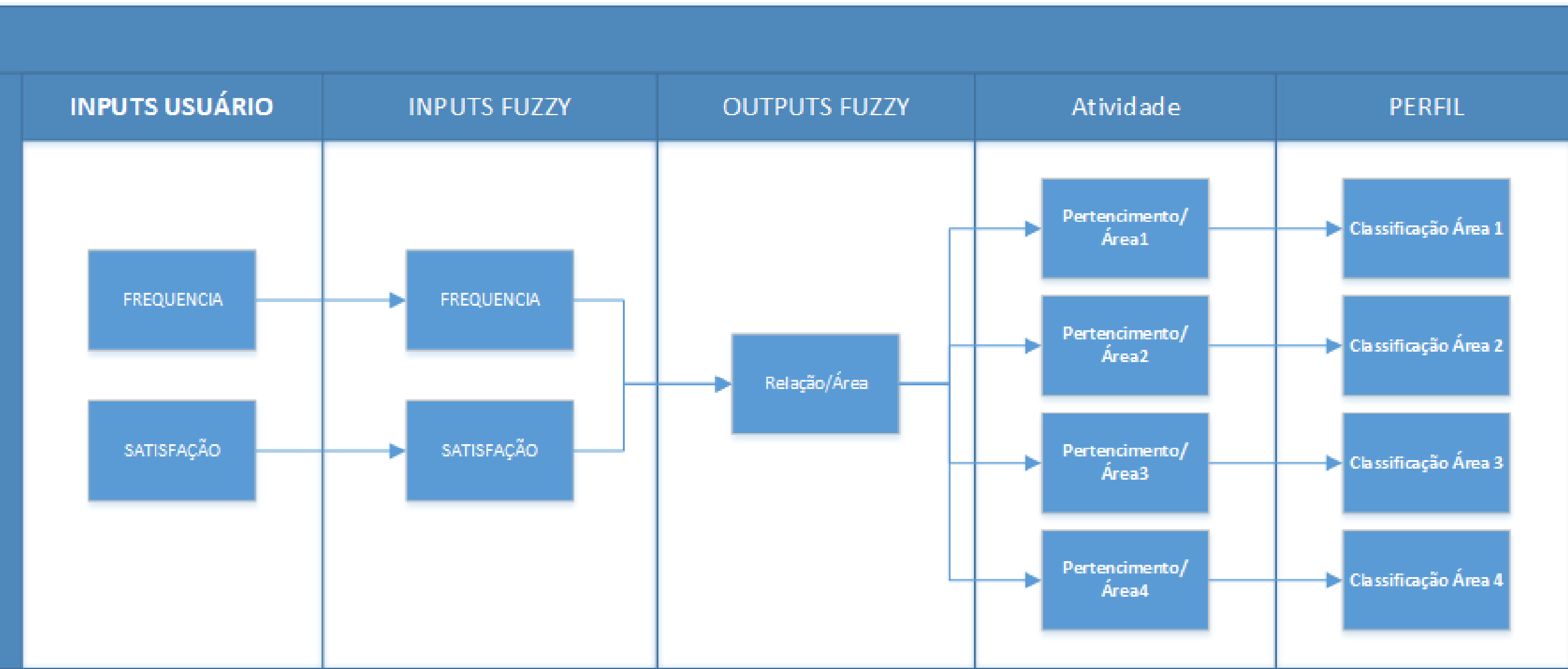
Close

Selected variable "AREA"

Problema

- Os atributos relacionados às atividades não mudam de usuário para usuário. Assim, perde o sentido esta entrada no sistema fuzzy.

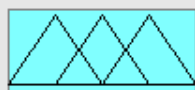
Segunda implementação



FIS Variables



FREQ



RELAÇÃO

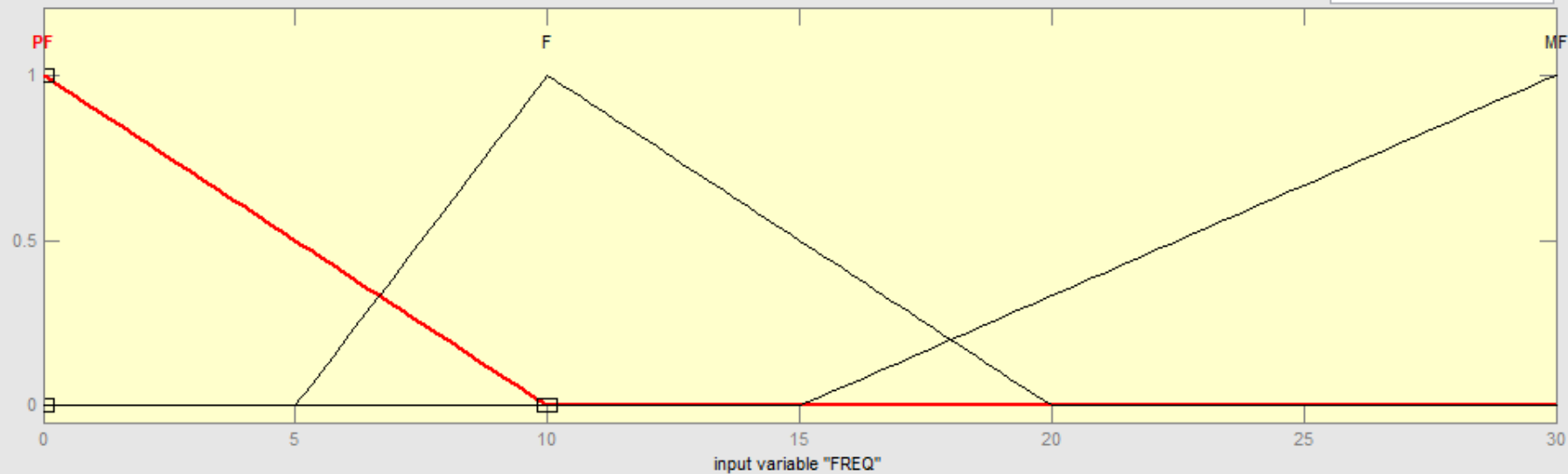


SATIS

Membership function plots

plot points:

181



Current Variable

Name FREQ

Type input

Range [0 30]

Display Range [0 30]

Current Membership Function (click on MF to select)

Name PF

Type trimf

Params [0 0 10]

Help

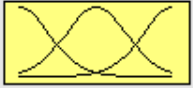
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Ready

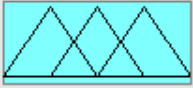
plot points:

181

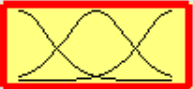
FIS Variables



FREQ

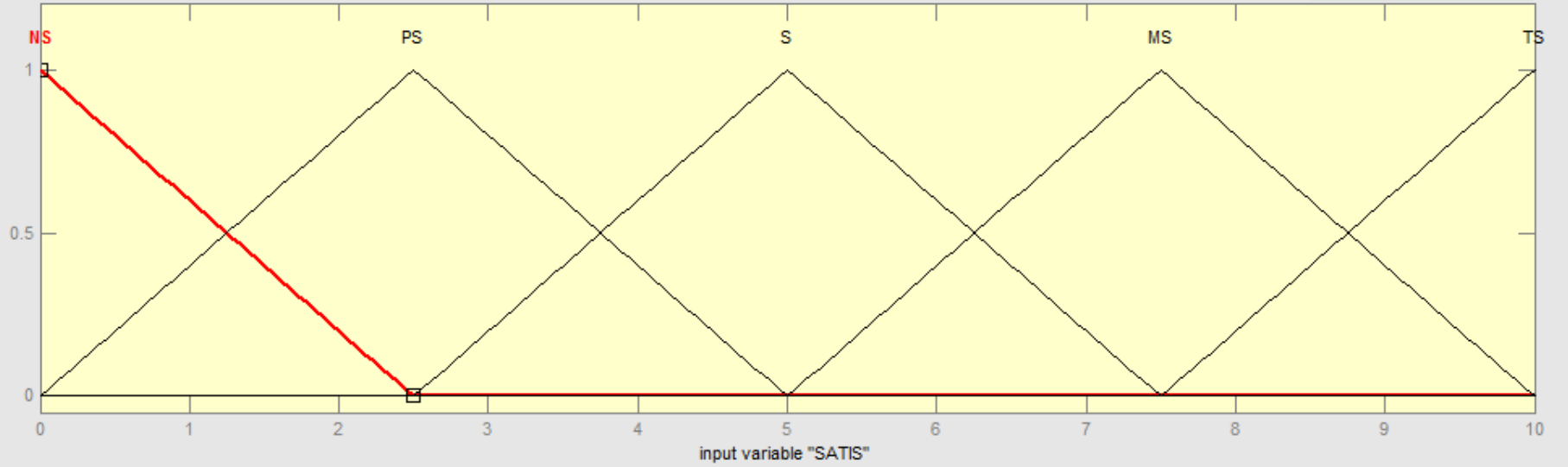


RELAÇÃO



SATIS

Membership function plots



Current Variable

Name

SATIS

Type

input

Range

[0 10]

Display Range

[0 10]

Current Membership Function (click on MF to select)

Name

NS

Type

trimf

Params

[-2.5 -2.776e-017 2.5]

Help

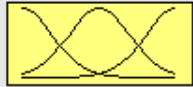
Close

Selected variable "SATIS"

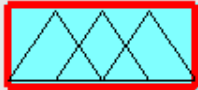
plot points:

181

FIS Variables



FREQ

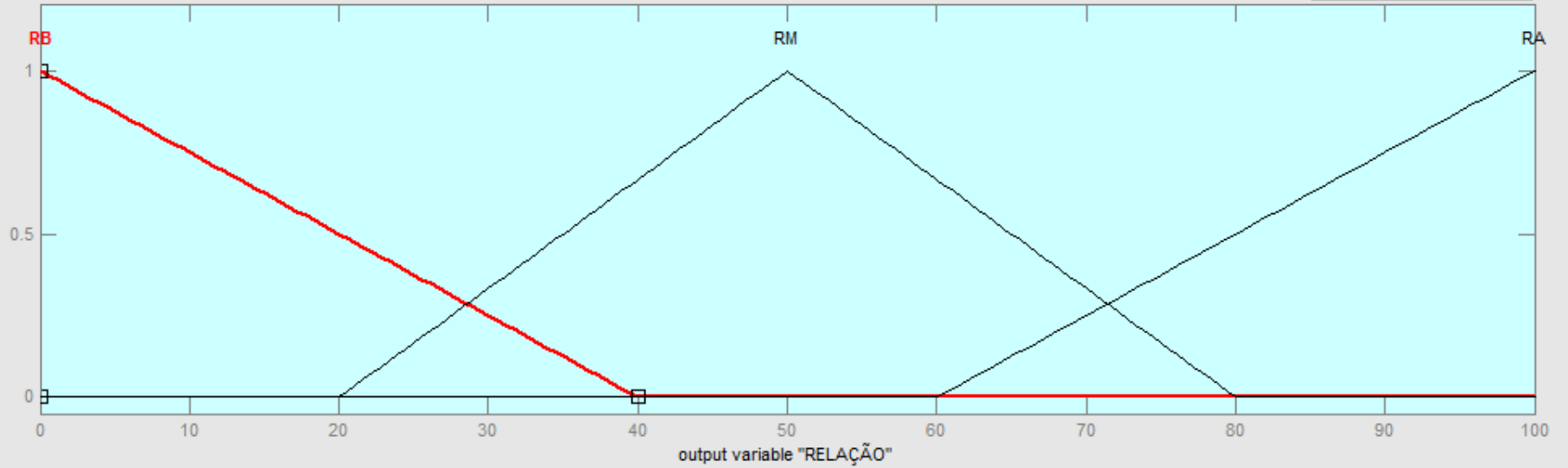


RELAÇÃO



SATIS

Membership function plots



Current Variable

Name

RELAÇÃO

Type

output

Range

[0 100]

Display Range

[0 100]

Current Membership Function (click on MF to select)

Name

RB

Type

trimf

Params

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Help

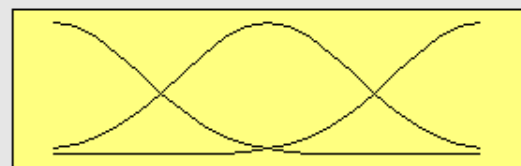
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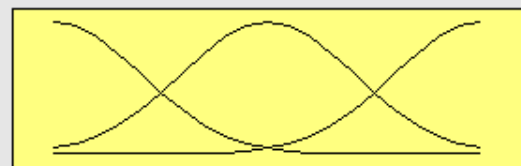
Regras



Calibração



FREQ



SATIS

FIS Name:

PROJETO2

And method

min

Or method

max

Implication

min

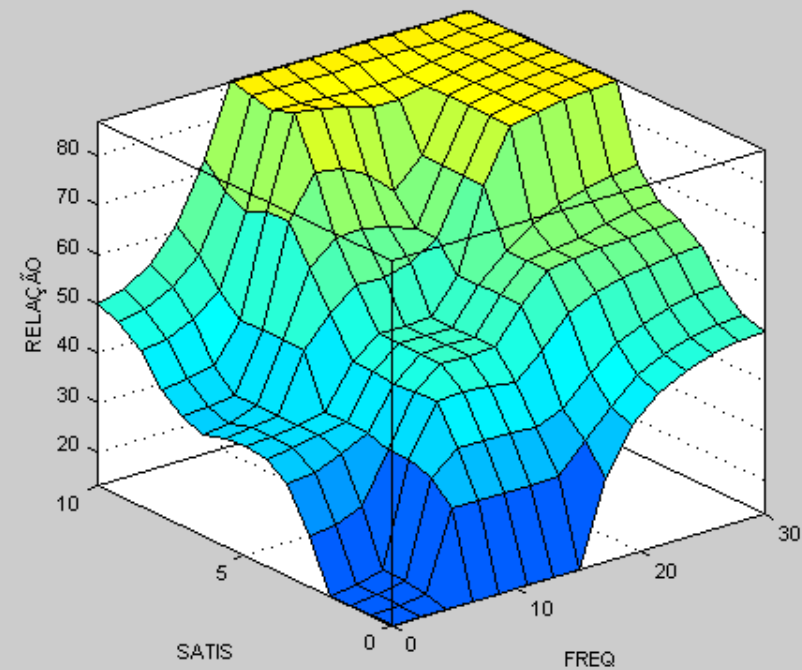
Aggregation

max

Defuzzification

centroid

Ready



X (input):

FREQ



Y (input):

SATIS



Z (output):

RELAÇÃO



X grids:

15

Y grids:

15

Evaluate

Ref. Input:

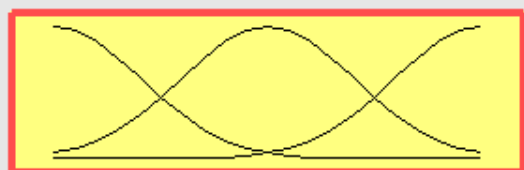
Plot points:

101

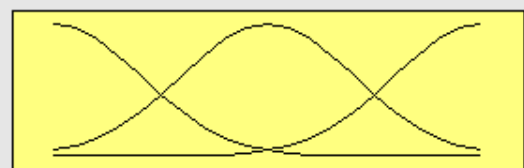
Help

Close

Ready



FREQ



SATIS

FIS Name:

PROJETO2

And method

prod

Or method

max

Implication

prod

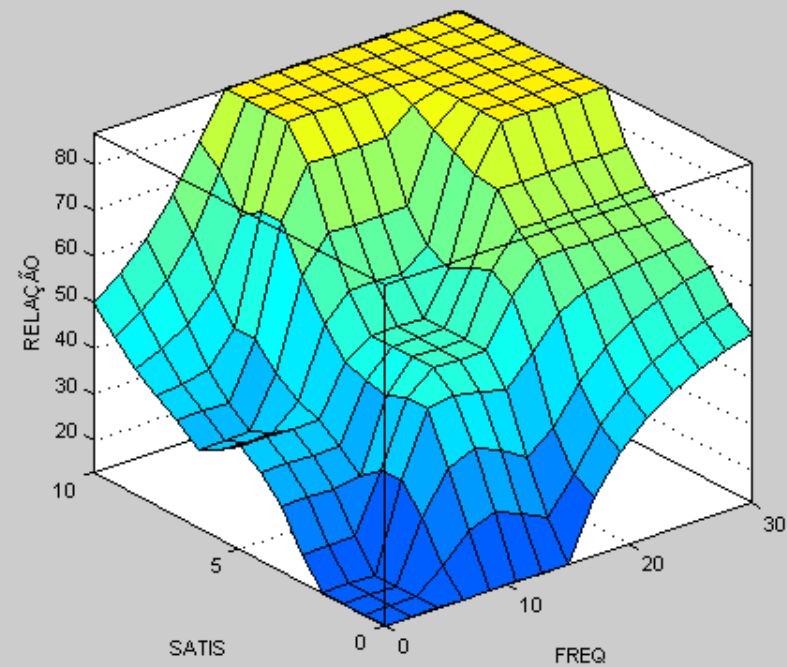
Aggregation

max

Defuzzification

centroid

Ready



X (input):

FREQ

Y (input):

SATIS

Z (output):

RELAÇÃO

X grids:

15

Y grids:

15

Evaluate

Ref. Input:

Plot points:

101

Help

Close

Ready



FIS Name:

PROJET02

And method

prod

Or method

max

Implication

prod

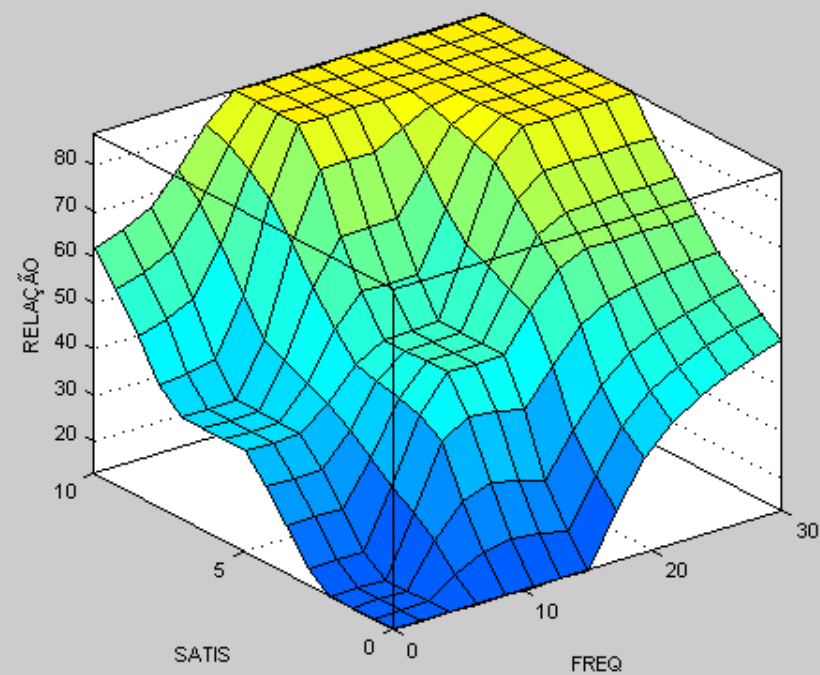
Aggregation

sum

Defuzzification

centroid

Ready



X (input):

FREQ

Y (input)

X grids:

15

Y grids:

SATIS

Z (output):

RELACÃO

Evaluate

Ref. Input:

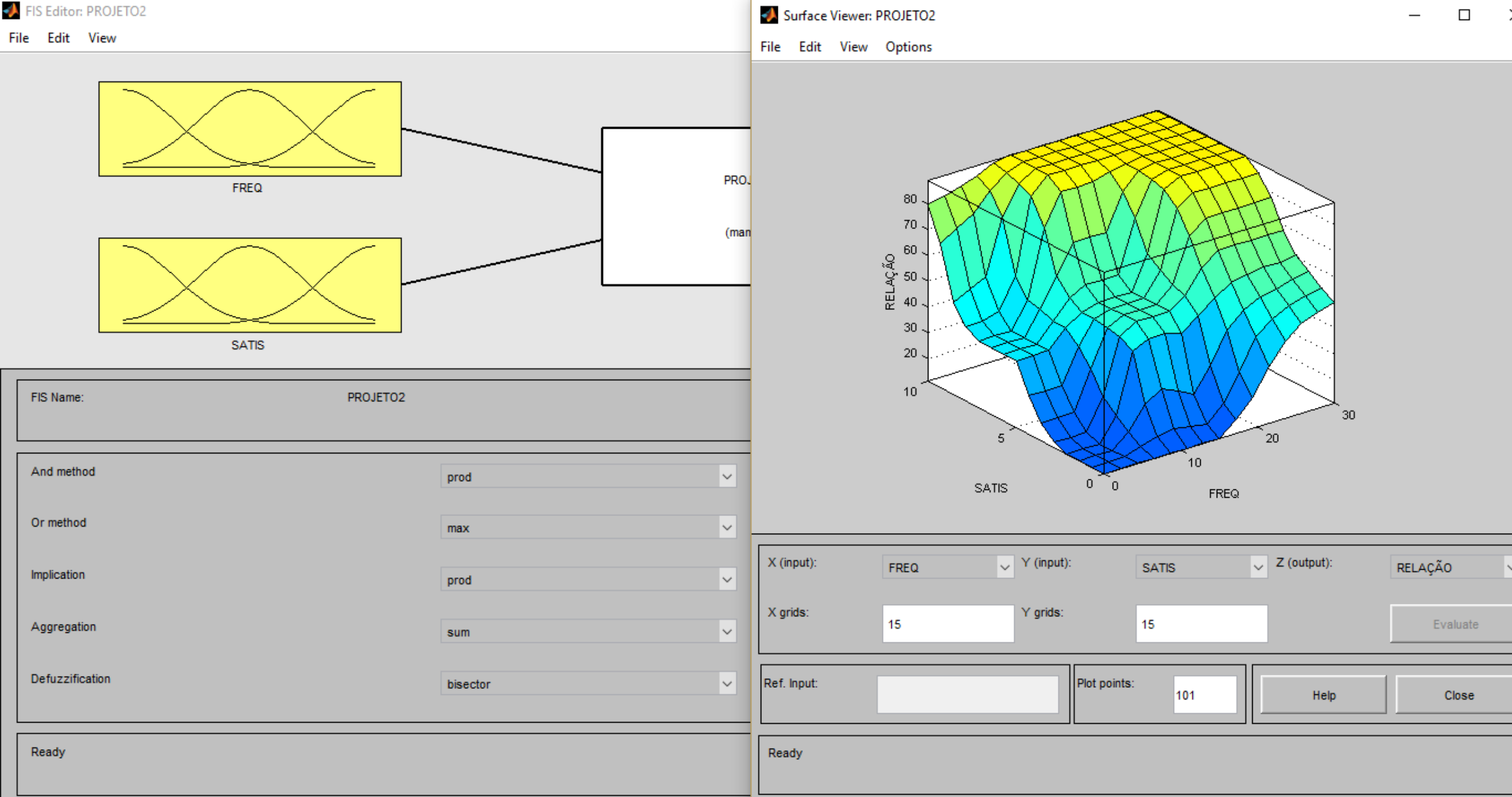
Plot points:

101

Help

Close

Ready



Calibração

- Uma calibração nos métodos de implicação e agregação possibilita uma melhora nos limites das saídas, além de eliminar vales, com platôs regulares.
- O resultados foram testados com base na interpretação do programador, porém, não houve testes com dados reais.
- Uma análise das regras deve ser feito para deixar o sistema mais preciso.

Obrigado

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2016