Oplossing rekentaak computergrafieken 2018-2019: coördinaten systemen

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gegevens:

$xw_{min}=-1.5$ $xw_{max}= 2.5$

$yw_{min}=-2.0$ $yw_{max}= 2.0$

h= 500 b= 500

near= 1.0 far= 12.0

Camera: (0,2,5)

P1:(1,1,1,1)

P2:(2,-1,1,1)

Wc-->Vc:

Theta=BgTan(y/z)=BgTan(2/5)=0.380506

R:

1	0	0	0
0	cos(theta)	-sin(theta)	0
0	-sin(theta)	-cos(theta	0
0	0	0	1

1	0	0	0
0	0.928477	-0.37139	0
0	-0.37139	-0.92848	0
0	0	0	1

T:

1	0	0	-x= 0
0	1	0	-y=-2
0	0	1	-z=-5
0	0	0	1

Mwc,vc=RxT=

1	0	0	0
0	0.928477	-0.37139	0
0	-0.37139	-0.92848	5.385165
0	0	0	1

Vc-->Pc

Sz=(near+far)/(near-far)=-1.18182

Tz=-(2*near*far)/(near-far)=2.181818

Mvc,pc:

-near	0	0	0
0	-near	0	0
0	0	Sz	Tz
0	0	-1	0

-1	0	0	0
0	-1	0	0
0	0	-1.181822	2.181818
0	0	-1	0

Vc-->nc
Mvc,nc:

-2*near/(xwmax-xwmin)	0	(xwmax+xwmin)/(xwmax-xwmin)	0
0	-2*near/(ywmax-ywmin)	(ywmax+ywmin)/(ywmax-ywmin)	0
0	0	(near+far)/(near-far)	-(2*near*far)/(near-far)
0	0	-1	0

-0.5	0	0.25	0
0	-0.5	0	0
0	0	-1.1818	2.1818182
0	0	-1	0

Nc-->Dc
S'x=(Xvmax-Xvmin)/2=250
S'y=(Yvmax-Yvmin)/2=250

T'x=(Xvmax+Xvmin)/2=250
T'y=(Yvmax+Yvmin)/2=250
(met Xvmin en Yvmin aan 0 gesteld)

Mnc,dc:

250	0	250
0	250	250
0	0	1

Punten:

Mwc,vc x P1=P1,vc	en Mwc,vc x P2=P2,vc
1	2
0.557086	-1.29987
4.085297	4.828079
1	1

Mvc,pc x P1,vc=P1,pc en Mvc,pc x P2,vc

-1	-2
-0.55709	-1.29987
-2.64626	-3.52409
-4.0853	-4.82808

Mvc,nc x P1,vc=P1,nc en Mvc,pc x P2,vc=P2,nc

0.5213	0.20702
-0.2785	0.64993
-2.6463	-3.5241
-4.0853	-4.8281

P1*= P2=*

P1,nc1	P2,nc1
P1,nc2	P2,nc2
P1,nc4	P2,nc4

Mnc,dc x P1* =P1,dc en Mvc,pc x P2*=P2,dc

-890.993	-1155.26
-1090.63	-1044.54
-4.0853	-4.8281

Schermcoordinaten= (bonvenste/onderste , midenste/onderste)

P1,scherm	P2,scherm
218.10	239.28
267.05	216.34

Dichtste punt bij de camera op basis van nc,Z
Denormaliseren:
P1,nc,z/onderste van P1,nc=0.648
P2,nc,z/onderste van P2,nc=0.730

met camera in Z=5 dus dan is P2 het dichtste