

UPG - 1/13

RA - 5000

DATA - OBRÁZK / IMAGE

NÁPAD - - - -

MODEL - OBRÁZOK / PICTURE

~10<sup>6</sup>

AP - GS - DV

WC

DC

USER OPERATOR

GUI OKNOVÝ SYSTÉM

DESKTOP

10 CLI

2D WINDOW

3D WF

4

2xBER

VIEWPORT

2D ANIMÁCIA

DC

SET WINDOW (W)

SET VIEWPORT (V)

SELECT TRANSF. MATRIX (M)

PHOTOGRAPH CAPTURING RESULT

SYNTEZA

ANALÝZA

REVERSESEARCH

INPUT

OUTPUT

8D

matematica

obrazka

mapa

meta

transpozícia

WC

X1

PASAPAR

PLACITA

h(t) = Cost

M

M<sup>-1</sup>

1 0 0

2 1 0

0 1 0

0 2 1

1

1. POLOHA

2. KĽEFA

3. UTOĽ

4. PLOCHA/OBSAH 2D

5. OBJEKT 3D

DESCARTES

1977 Mandelbrot

~ 9,26986... = log<sub>2</sub>(4)

1 1/2

1 1/3

1 1/4

1 1/5

1 1/6

1 1/7

1 1/8

1 1/9

1 1/10

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1 1/97

1 1/98

1 1/99

1 1/100

Ako zobrazit bod z reality na obrazovke? 1. Ručne, ak máme nápad. 2. Fotograficky, ak máme dáta. 3. Maticovo, ak máme model. // Tabuľa UPG1-LS24.

UPG - 2/13 @ 11-111

KONCEPTUÁLNY MODEL

ETRIKETY (P) PACTOVANE

RELATIVISTICKY

3D KRYCH

FRAKTÁL

ZELENE

3D PLAST

TRI BODY (FRONT)

TRI HEART (COS THUS)

INPUT = {x, y, z}

5D? VOCI, [0,255], 2<sup>8</sup> // CDIA; 2<sup>12</sup>

[0,255] R, G, B

INPUT = {m<sub>0</sub>, m<sub>1</sub>, ..., m<sub>KT<sub>2</sub></sub>}

OUTPUT (P<sub>h</sub>, A<sub>h</sub>)

40

38

CS = FRIZ (Rakos - MID)

POINT CLOUD

METRIKY

PROPERTIES

analogie

metafora

ntropy

Explaining Algorithms Using Lotteries

FORISKE-STEINOVA

99%

DECLARAT, 1932

2+3=2

CLIPPING

AP - GS - DV

WINDOW

VIEWPORT

~300

UTAH TEAPOT

MID

135

0101

71

Alg strategija

Vp. p. d. i. g. n. a.

REVERSESEARCH

Referenčný model PG, orezanie do obdĺžnika, 6 výstupných funkcií a ich parametre. // Tabuľa UPG2-LS24.

UPG-3/13

VEKHOŠTI 100' MOŠTIN  
ZPOČNOŠTI

KOHERENCIA ⇒ ITERÁCIA  
GEOM. RÁDIONH DRC

1D  $\lambda$  400nm 700nm

2D OIE 1925

3D  $(x, y, 0, 1) = (x, y, 0, 1)$

3D "RGB KOCEA"  $(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$

3D "TLAR" PARAMETRE

ATPIBUT VŤIČADI APPEARANCE

COLOR INDEX

MODUL PŘEKAZ (1,0,0)  $G(x,y)$   
INPUT: P, A, B  
NOP, WA IT,

INTERPOLÁCIA  
NN NEAREST NEIGHBOUR  
LIN. INTERP.  
KUBICK. INTERP.

de Casteljau

BEŽIACI KUBIK

FERKOAT@GMAIL.COM

COORDINATE SYSTEMS: UC, LC, WC, VPC, TCC, UV, TEXTURE (R, G, B), (G, B, R)

OUTPUT (E): POLYLINE, POLYTRIANGLE, FILL AREA, HUB, CARTESIAN

INPUT (E): LOCATOR, CALCULATOR, STRING, TICK, CHOICE, STROKE

STR. G.S.

SET  
GET/INQUIRE  
WORDSTATION  
INITIATION...

AP GS DV

ISO GES  
Open GC

GUI  
VEKHOŠTI

PROCEDURÁLNE  
PROSPATOVANIE

DECLARATÍVNE

MODERNÁNE  
ZOBRAZOVANIE  
TEXT, SYS, VIEW

W3 SCHOOLS

"MECH"

DECLARATÍVNE 1932

Funkčnosť, koherencia, interpolácia. Photo: Viera GLEVITZKÁ 2024 // Tabuľa UPG3-LS24.

UPG-4/13

MID 7

GS

OUTPUT: POLYLINE, POLYTRIANGLE, FILL AREA, TEXT

PL INDEX

2D

FACTOR

TECH. KRESLENIE

PASTER  $E^2 \rightarrow E^2$   
DPA v Min Point

SUSEDNOST  $\infty \rightarrow 4 \times 8$   
32

I. FLOOD FILL  $E^2$   
RECURSIVE  
SEED

SET PL COOR INDEX

ASPECT SOURCE FLAG  
PÁRANIE P800U

II. PARTIT  $E^2$

III. TRANZLÉ VŤIČANIE

2D STATIC  $X \downarrow 1D$   $Y \downarrow 1D$

NP-HARD

SWEPTLINE 3

TAH

HRANKA  
SELECTION

IMAGE PROCESSING

OBRAZ  $\rightarrow$  MODEL

JEDNODUCHÝ ALG. HRANKA  
FILL AREA

1. NÁDI 1. BOD VE STRI  
2. "OBCHÁDAN"  $\square$   
3. AK NOLY PIXEL VÁ SĽADNICE START(x,y)  
TAK STOP.

APLIKÁCIE INTERPOLÁCIE  
1.  $\odot$   $\odot$   $\odot$   
2. DECLARATÍVNE EDGE POINT  
3. VŤIČADI POINT

GLAVITZKÁ, 2024

A ČO KED PŘESEČNÍK?  
TRAFI

Fill Areas, na ceste k významu. Pred videom M. Bozek, Mnohouholníky. // Tabuľa UPG4-LS24.

LATUPEK ALG. FOR SORTING

MNOHOUHOLNÍKY >> VÍZUAM

Distance (1/4g)

⑤ PLOCHA JEDNOUHOLEHO POLYEDRU

$S = \{s_i | s_i = \{a, b\}, a, b \in E\}$  NEPRÁVILNÁ HRANA

SIDES - POKRÝVA A PÁNOU → TRIANGULÁCIA [KAPITOLA] [STRUKTURA]

DELAVES-TOUSSAINT

KLAPOTY

CH(S)

Mid

- DT
- 300 - 0 NE HRANT ~ EAR CUTTING / ITERÁCIA
- ZMETANÍM
- FLOOD FILL
- RANDOM + TEST
- SORT, PO NÁKRAKÁČIACH, SPEEDY
- HRT ma Σ A S u h r a n NP-HARD
- KRÁT MĚŘÍ

LOCUS APPROACH

ISORT, SKEETUNG

NON-TRIVIAL

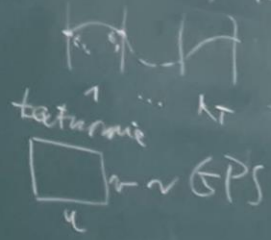
Mnohouhelníky, avizo Bozek, ako plochu, ako triangulovat... // Tabuľa UPG5-LS24.

# UPG-6

- explicitne
- implicitne
- parametricky

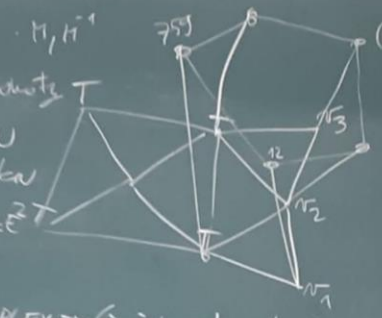
$y = f(x)$   
 $f(x, y, z) = 0$   
 body, relty, mesh...  
 e.g. Bezier spline

WINNER

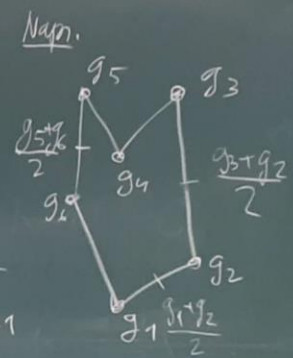


# Mid

- I. MATICHOV
- II. KOHERENTNE
- III. de CASTELJEAN
- IV.  $S = \{s_1 \dots s_n\} | s_i \in \mathbb{R}^T$



height



WINNER

DT  $(x, y) \in T$   
 $[Delaunay, 1932]$

STRIPES + COMPLEXITY (počet operácií / celkomplexy)

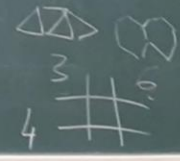
OBSERVED  $N$

1	70	760	...
$t$	$t_{10}$	$t_{100}$	

QUALITA GRAFOV TEORETICKA

[Voronoi 1908]

SUSEDNOST V.D.  
 HRANA D.T.



Voronoi, Delaunay, stripes. Pred Mid. // Tabuľa UPG6-LS24.

# UPG-7 & MID

Ako 3D MODEL?

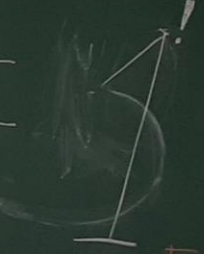
- VOXELIZÁCIA
- IBR, eg STREET VIEW
- B-REP
- F-REP
- CSG-stream



# PHOTOREALISM

GEOM. MODEL  $(x, y, z, t)$   
 $(r, g, b, \alpha)$   
 40' 53  
 58  
 ANIM. VR.  
 DESIGN  
 MODEL  
 DATA

EŠTE



AD, MOŽNO PISAŤ / KRESLIŤ AJ FAREBNE



Ako 3D modelovat? Fotorealizmus. Mid. // Tabuľa UPG7-LS24.

Ako3Dreprezentovat? Turtle & Eagle, shape grammars... Fotorealizmus 2. ZPGSO. // Tabuľa UPG8-LS24.