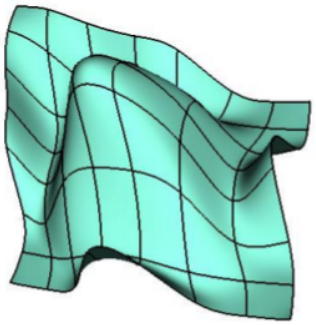
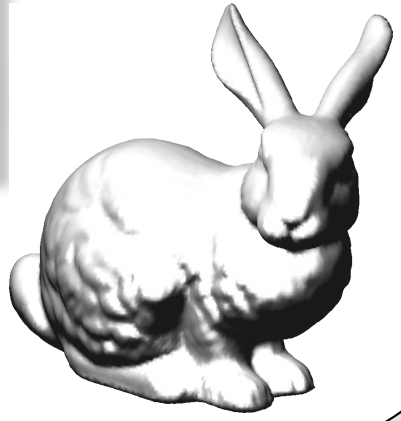
Synthèse d'images

Computer Graphics





Synthèse d'images: C'est quoi ?

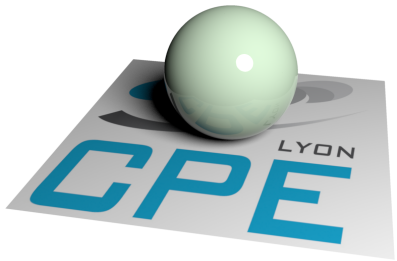
Modèle 3D

synthèse

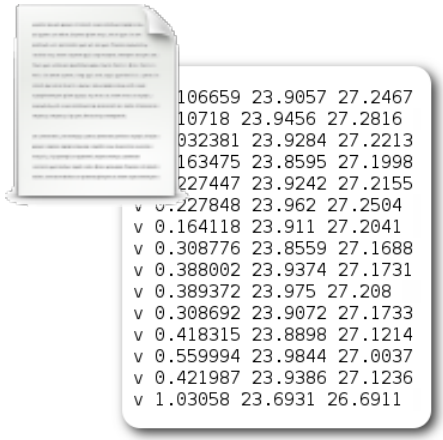
Image

ex **1**.

$$x^2 + y^2 + z^2 = 0$$



ex **2**.



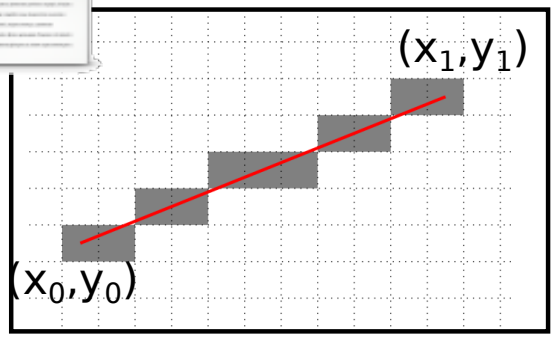
Partie 1: Tracé de segments discrets

[Cours/TP]

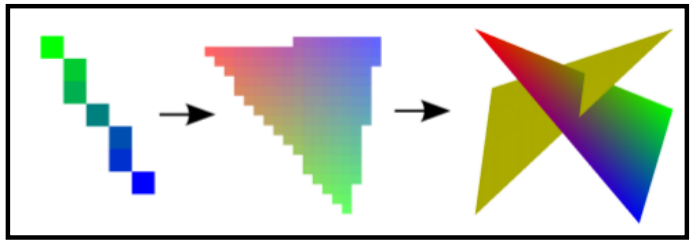
[mon_image.jpg]

(x_0,y_0) ; (x_1,y_1)

??




```
void image_io::export_ppm(const std::string& filename,const image&
{
    std::ofstream stream(filename.c_str(),std::ofstream::out);
    if(!stream.good())
        throw exception_image("Error in opening file "+filename+".

    unsigned int Nx=pic.get_Nx();
    unsigned int Ny=pic.get_Ny();

    //magic number
    stream<<"P3 \n";
    //size
    stream<<Nx<<" "<<Ny<<" \n";
    //color number
    stream<<"255"<<std::endl;

    std::stringstream str;
    for(unsigned int k2=0;k2<Nx;++k2)
        for(unsigned int k1=0;k1<Ny;++k1)
            str<<pic(p2d(k1,k2))<<std::endl;

    stream<<str.str();

    stream.close();
```

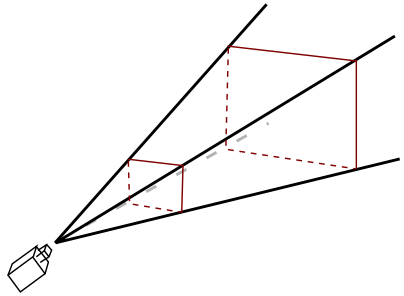


Code [C++]

Partie 2: Rendu projectif

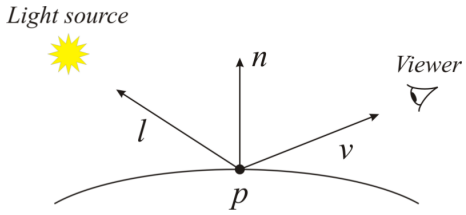
[Cours/TP]

Projection:

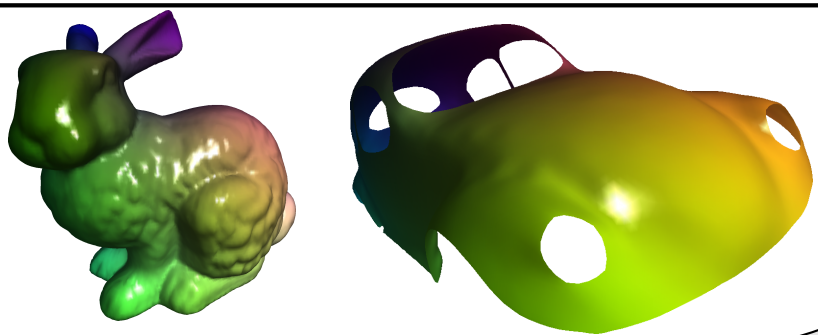


$$P = \left(\begin{array}{ccc|c} p_{00} & p_{01} & p_{02} & p_{03} \\ p_{10} & p_{11} & p_{12} & p_{13} \\ p_{20} & p_{21} & p_{22} & p_{23} \\ \hline p_{30} & p_{31} & p_{32} & p_{33} \end{array}\right)$$

Illumination:

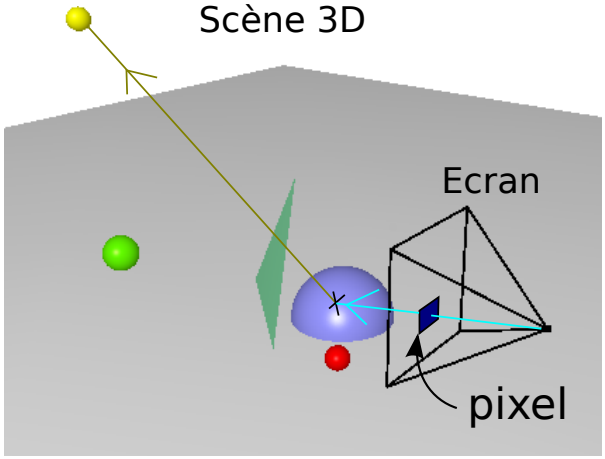


=> Maillages 3D

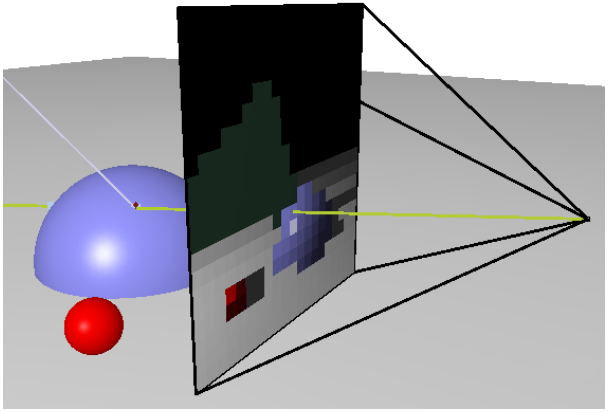


Partie 3: Lancé de rayons

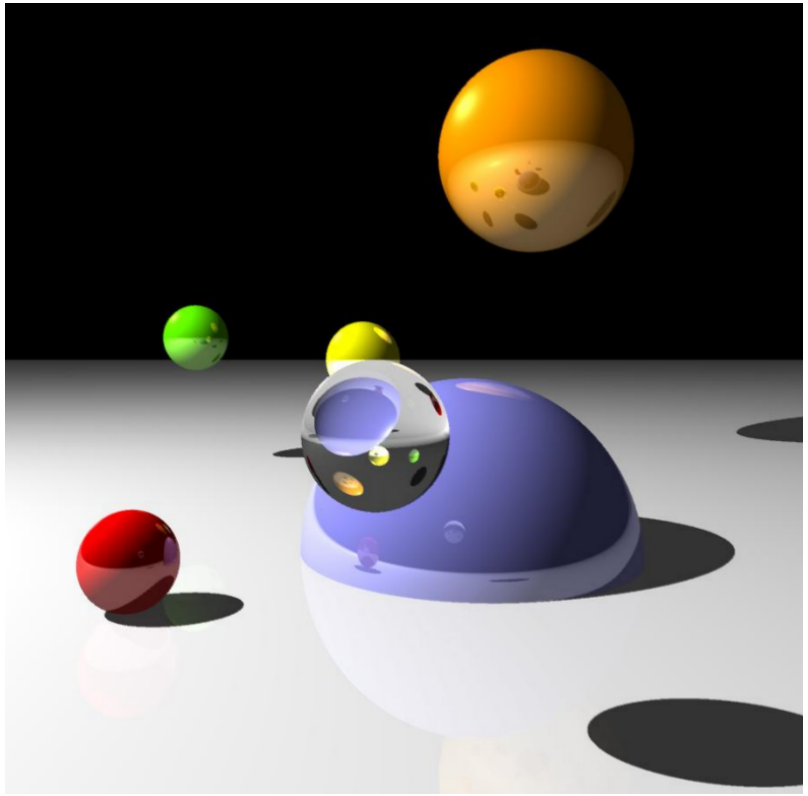
[Cours/TP]



lancé de rayons



Résultat année dernière



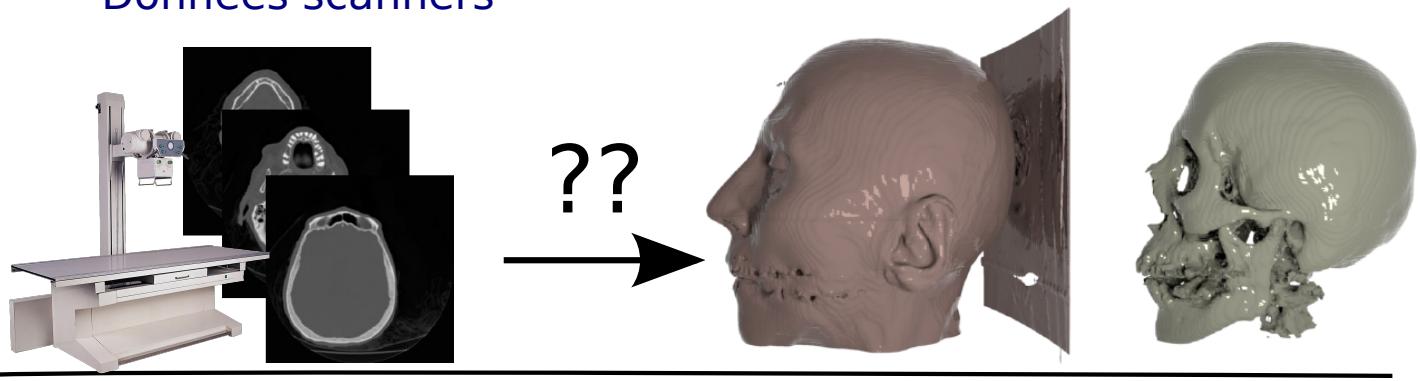
[4ETI 2012, Vaccalut/Pagliardini]

Partie 4: Rendu volumique

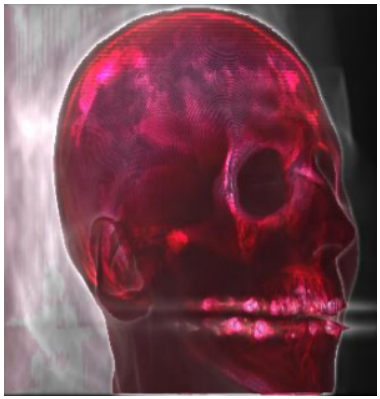
[Cours/TP] *Imagerie médicale*

Données scanners

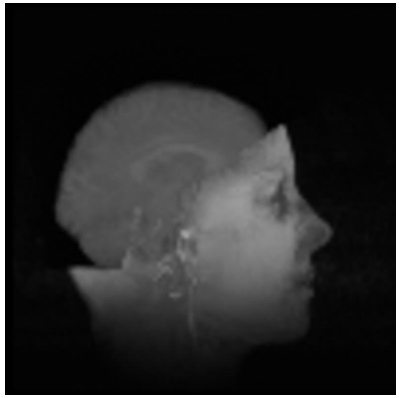
visualisation



Résultats année dernière



[4ETI 2012 Pagliardini/Vaccalut]

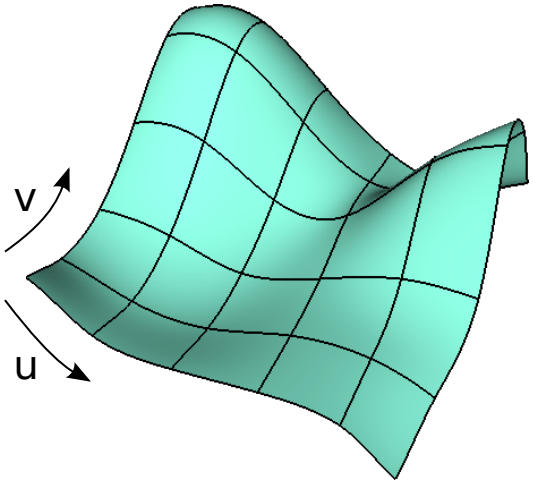


[4ETI 2012 Hauss/Frament]

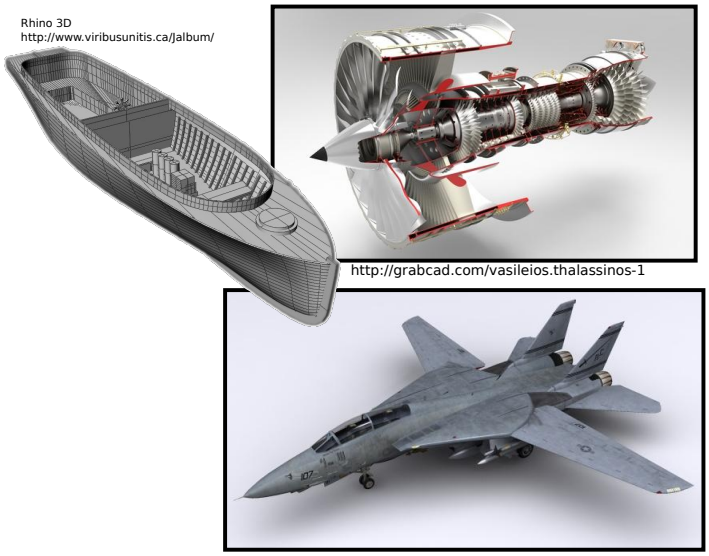
[4ETI 2012 Kaiser/Rage]

Partie 5: Modélisation paramétrique

[Cours/TP]



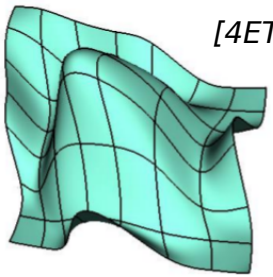
$$f(u,v) = \mathbf{u}\,\mathrm{M}\,\mathrm{P}\,\mathrm{M}^T\,\mathbf{v}^T$$

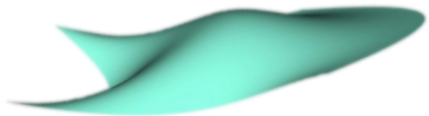


Applications: CAO

Résultats année dernière:

[4ETI 2012, Salla/Rousset]

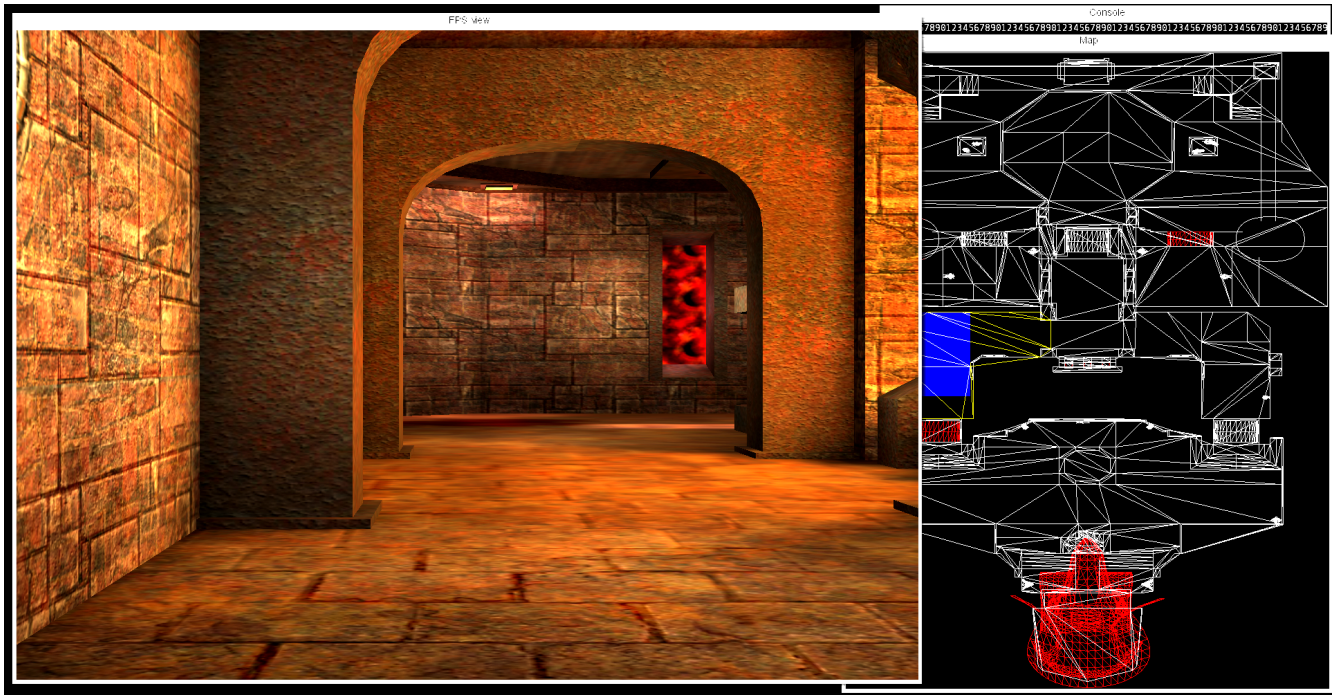




[4ETI 2012, Pagliardini/Vaccalut]

Partie 6: Mondes virtuels

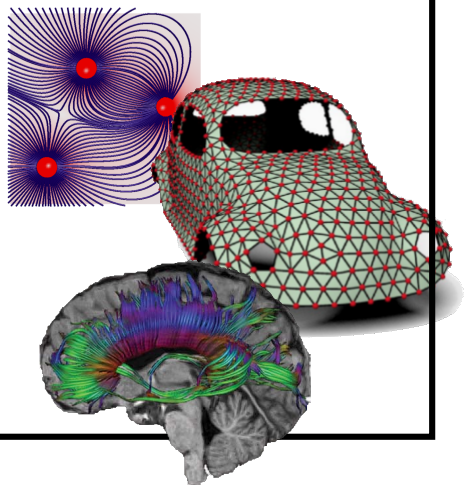
[Cours]



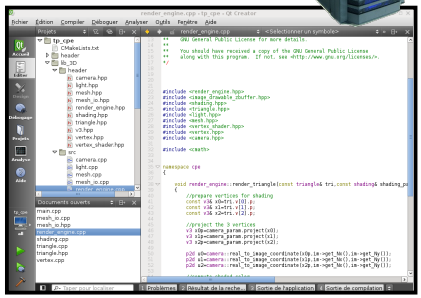
Fonctionnement module

Cours
(2h)

$$\Delta' =< x_0 - x_s, \mathbf{u} >^2 - (\|x_0 - x_s\|^2 - r^2)$$
$$t_{1/2} = - < x_0 - x_s, \mathbf{u} > \pm\sqrt{\Delta}$$

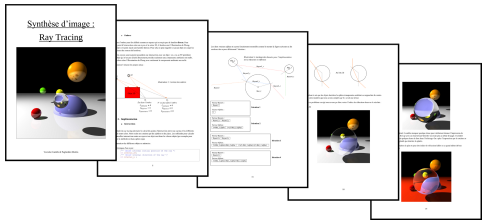


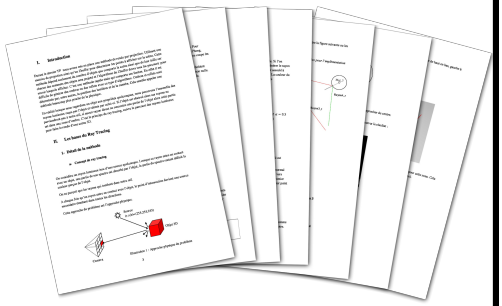
C++



TP
(4h)

Rapports





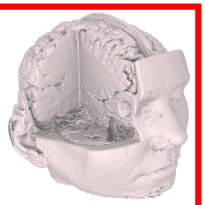
Intervenants: Damien Rohmer & David Odin

Débouchés Synthèse d'Images

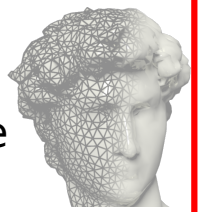
Intitulés métiers:

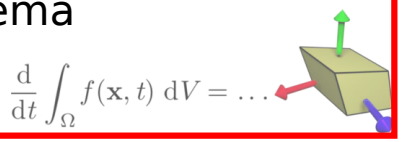
Développeurs logiciels
/ Software engineer
Analyste programmeur
Ingénieur developpement
Ingénieur recherche
Ingénieur d'études
Editeur logiciels

Mots clés:



Jeux Vidéos, serious game
CAO
Imagerie médicale
Simulation, moteur physique
Calcul numérique
Graphique 3D, cinéma
Reconstruction 3D
...





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