



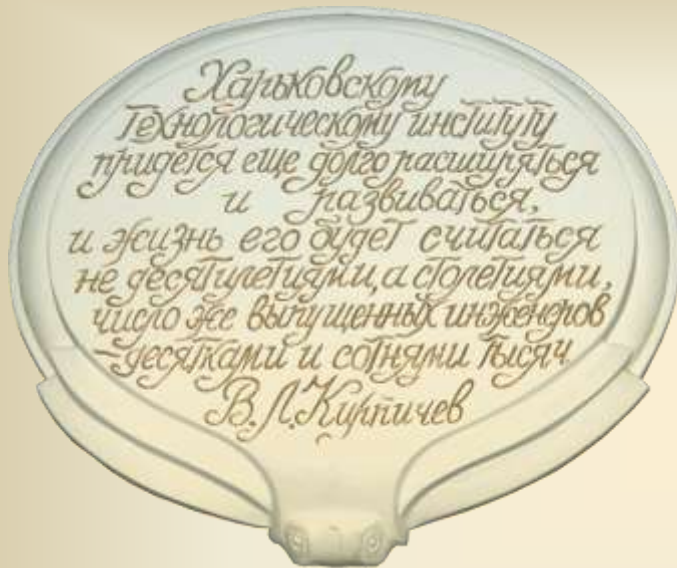
National Technical University
«Kharkiv Polytechnic Institute»



Mechanical & Technological
Department



Geometric Modeling and Computer Graphics Department



«The Kharkov Institute of Technology will need to continue to grow for a very long time. Its life will not be measured in decades, but in centuries ... and the number of engineers it graduates will not be in the tens of thousands, but in the hundreds of thousands».

V.L.Kyrpychov



Specialty 122 Computer Sciences and Information Technologies

Specialization 122.01 GEOMETRICAL MODELING AND GRAPHIC INFORMATION TECHNOLOGIES

Level I: Bachelor's Degree

Level II: Master's Degree



EDUCATIONAL EMPHASIS

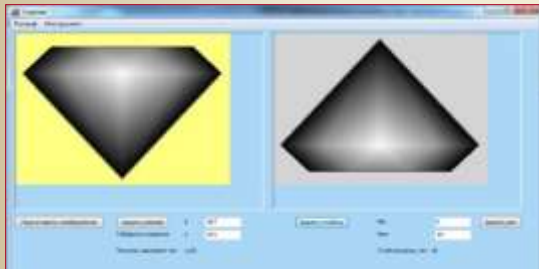
Development of software for various purposes

Geometric modeling of objects, phenomena and processes

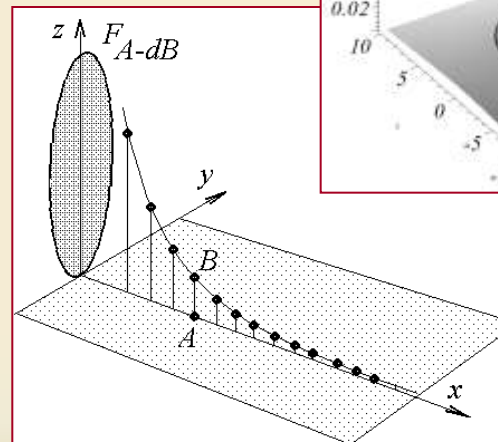
Elaboration of computer games components

Development of a software add-on to create a control code, which is used by the CNC system

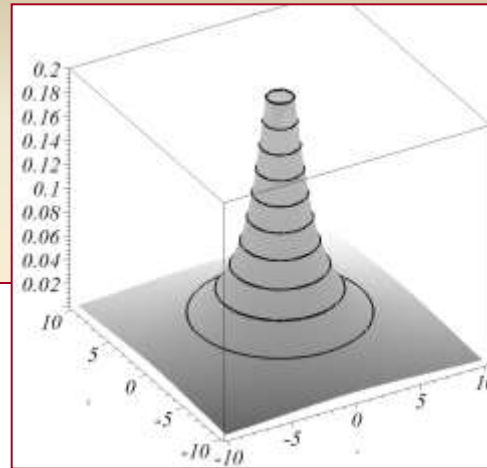
Image processing



Finished part



Modeling of heat transfer by radiation with the calculation of the form factors



Visualization of architectural and construction projects

Formation of engineering constructions parts and assemblies

Development of WEB-sites

Creation of form style of enterprises and organizations

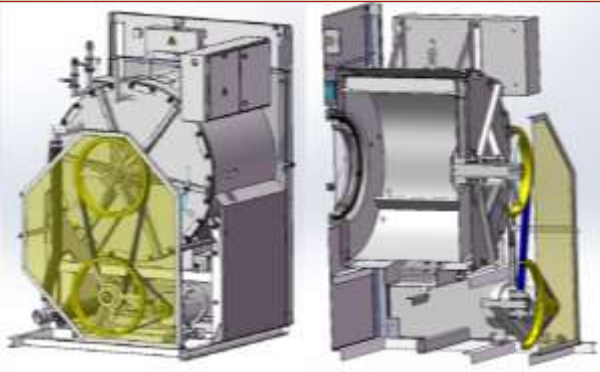


PROSPECTS OF EMPLOYMENT

Machine-building enterprises

Developers of software for various purposes

Computer game developers



```

CreatePart(Shape);
BMMap1 = TBMap.Create;
if OpenPCView(BMap1) Error die then
begin
  CanvasBrush.Color := White;
  Canvas.FillRect(Canvas.ClipRect);
  BMMap1 := cast to TBMap(OpenPCView(BMap1));
  Canvas.Draw(BMMap1);
end;

TapeView.Create;
if HideCanvas=True then
begin
  T := Canvas.PenColor;
  Shape1.Brush.Color := T;
end;

ShapeView.Create;
if HideCanvas=True then
begin
  T := Canvas.PenColor;
  Shape1.Brush.Color := T;
end;
    
```



The main educational disciplines of the educational program of the
Level I: Bachelor's Degree in specialization
"Geometric modeling and graphic information technologies"
could help to study:

Basics of graphic composition

Vector and raster graphics

3D modeling



Creative work
in vector graphics



Learning the basics of composition



Modeling of the character for computer game



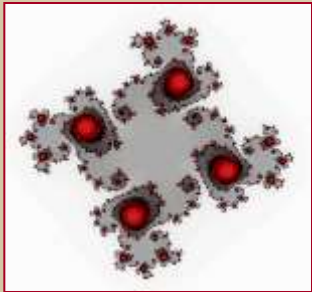
Processing of artistic
images



Creating and editing a bitmap

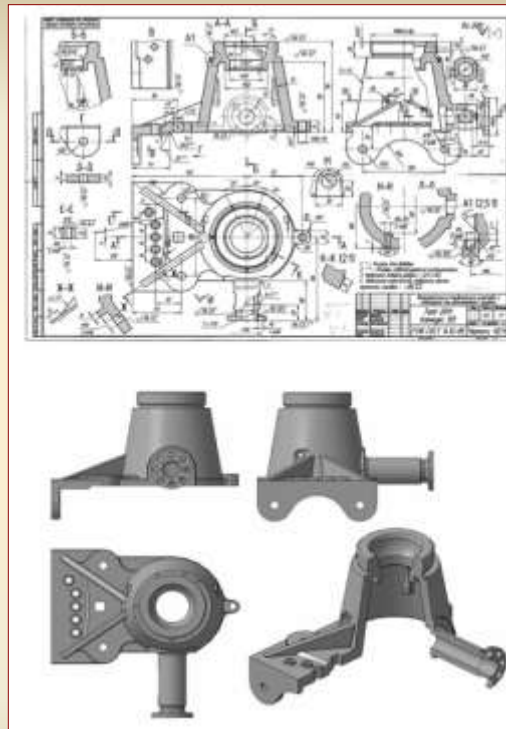


Geometric modeling in computer graphics



The result of the individual task
about fractal graphics visualization

Graphic design systems



Design document
and 3D model of detail

WEB programming



The fragment of application part
of course project



The main educational disciplines of the educational program of the
Level II: Master's Degree in specialization
"Geometric modeling and graphic information technologies"
could help to study:

Simulation of special effects
in computer graphics

Technologies for recognizing geometric
images and computer vision

Examples of course works

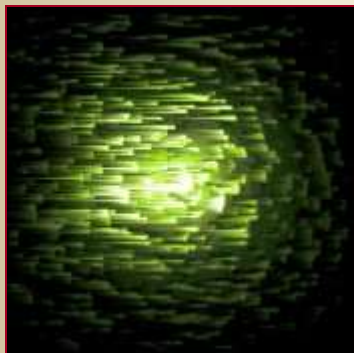


Image transformation
in shades of gray



The result of
Sobel's work

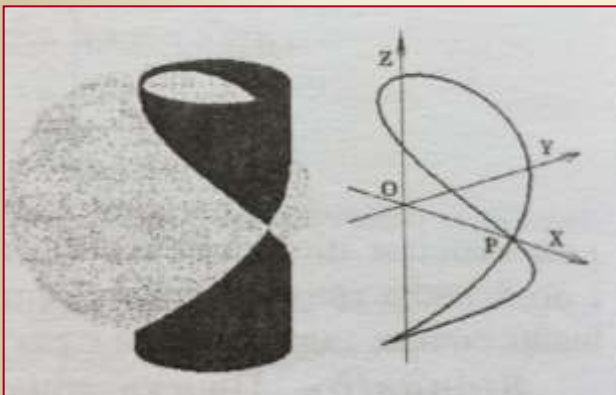
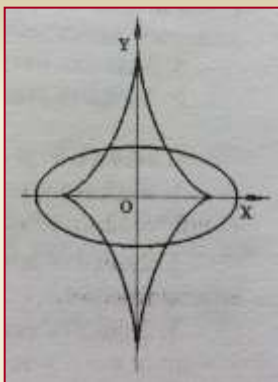


Feature extraction (histogram
of oriented gradients)



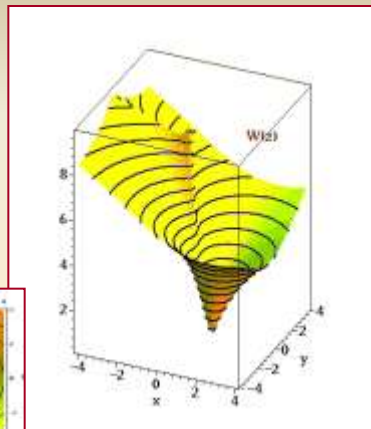
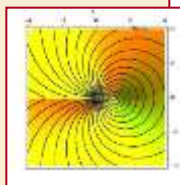
Methodology of scientific research

Graphical results of solving problems on the theme "Theory of curves"

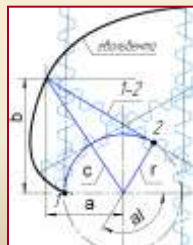


Geometric modeling of objects, phenomena and processes

Graphical representation of physical fields models

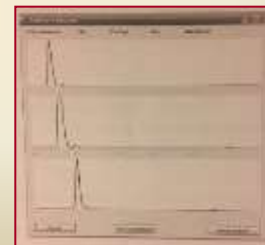


Modeling of dynamic objects



Programming of graphic systems

The interface of the course work: «Determination of the sea borders from the satellite»

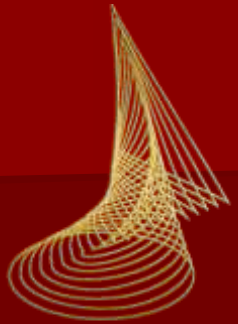


The histogram of the distribution of parameters



The Geometric Modeling and Computer Graphics Department occupies the 6th floor of the high-rise educational building U1. It has 8 training venues, an array of training models and engineering units, and a training room well equipped with computers. Classes are held with multimedia assistance.

Students often receive top places in competitions of student scientific works and olympiads of academic subjects. They also present papers at various scientific conferences, and participate in a wide range of research and educational projects.

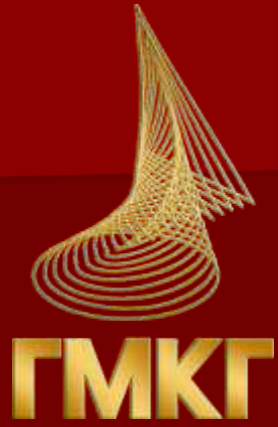


ГМКГ



At the Geometric Modeling and Computer Graphics Department highly qualified professors and associate professors – including 2 doctors of technical sciences and 16 candidates of technical sciences – are engaged in professional activities.

After receiving a master's degree, those wishing may continue in educational programs of the Level III of higher education in order to attain a Ph.D.



The main emphasis of the scientific activity of the department:

- **Problems relating to objects formation and visualization of their geometric models;**
- **Problems relating to geometric modeling of complex dynamic systems;**
- **Problems relating to gear quality and durability;**
- **Problems relating to the recognition of geometric images, technologies animation and rendering;**
- **Development of virtual products based on the creation of two-dimensional and three-dimensional models.**



**The head of the department:
Olga Shoman, Professor,
Doctor of Technical Sciences**



