Meios Computacionais no Ensino

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Trabalho 1:

Inscrição na lista [Tec-Mat](#), Mat no Básico, Mat no Secundário, Mat Feliz, Macs-com-rede e Hist-Mat-Port. Escolha de duas mensagens de duas das listas (uma de cada lista) que ache interessante e que de algum modo justifique alguma vantagem do uso deste tipo de meio de comunicação. Elaboração de um relatório com 3 a 10 páginas (a enviar para a zona de trabalhos do InforEstudante, em formato PDF) contendo um resumo do conteúdo dessas mensagens e um relatório justficando o interesse e vantagem das mensagens escolhidas.

1)

Aos 85 anos
Morreu Mandelbrot, o pai dos fractais
Teresa Firmino
17.10.2010

Inventou o termo fractal, na década de 70, que veio a torná-lo mundialmente famoso. Benoît Mandelbrot, o matemático franco-americano que descreveu uma nova classe de objectos matemáticos, com uma geometria dita fractal, morreu de cancro do pâncreas aos 85 anos, em Cambridge, nos Estados, Unidos, onde vivia - anunciou hoje a sua família.

Nascido na Polónia, numa família judia, Mandelbrot mudou-se para Paris quando tinha 11 anos, em 1936, numa antecipação da ameaça nazi. Durante a II Guerra Mundial trabalhou numa quinta
em França e, depois da guerra, estudou em Paris e na Califórnia. Em 1952, concluiu o doutoramento em ciências matemáticas em Paris; em 1958, rumou
aos Estados Unidos para fazer investigação científica na IBM, onde permaneceu cerca de 30

anos. No final da década de 80, juntou-se à Universidade de Yale, onde ficou até à sua reforma, em 2005.

Foi em 1975 que Mandelbrot inventou o termo fractal, para descrever objectos matemáticos fragmentados e irregulares, cuja estrutura se repete a diferentes escalas. Matematicamente, podem ser objectos infinitos, em que escalas cada vez mais pequenas repetem a geometria da escala maior. A imagem de fractais mais conhecida chama-se precisamente Conjunto de Mandelbrot.

A natureza está repleta de objectos com geometria fractal (que, neste caso, não se repete infinitamente), como é o caso de uma linha costeira ou do sistema de circulação sanguínea. Ou de uma couve-flor, o exemplo que Mandelbrot escolheu no início deste ano, numa das famosas conferências TED, nos EUA. "Se cortarmos um dos ramos da couve-flor, vemos toda a couve-flor, mas mais pequena. Se cortarmos o ramo outra vez, e mais outra, e outra, teremos couves-flores mais pequenas. Portanto, há formas que têm esta peculiar propriedade, em que cada parte é como o

todo, mas mais pequena."

Os fractais, que muitos dos pares de Mandelbrot começaram por considerar "monstruosos", nas palavras do matemático, vieram a ter implicações em várias áreas, desde a biologia até à física, astronomia ou o sistema financeiro. O seu livro "A Geometria Fractal da Natureza", de 1982, popularizou estes objectos matemáticos, mesmo entre não especialistas.

O Presidente de França, Nicolas Sarkozy, salientou, em comunicado, que Mandelbrot tinha um "espírito poderoso, original, que nunca hesitou em inovar e em bater-se contra ideias preconcebidas".

This massage is about the death of the famous mathematician Felix Mandelbrot, who is famous for the fundamental discoveries on the fields of fractals. The post that has been published in 17.10.2010 describes the live and the works of Mandelbrot and gives some views of the influence of his work. It is also stressed, that the fractal structures Mandelbrot was working with are a common structure, that appears in various forms in the nature and can be found in nearly all sciences like chemistry, physics, biology and so on.
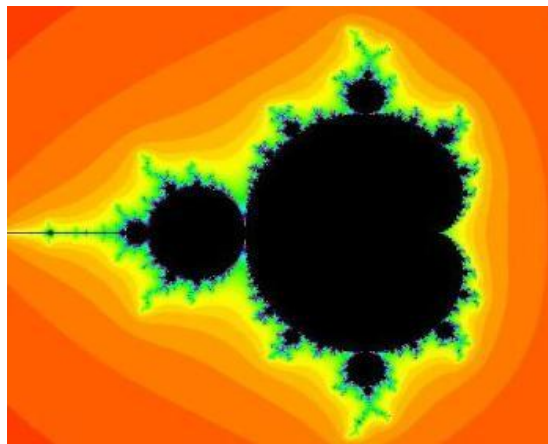
I think that this post is interesting, because fractals are a kind of mathematics that is really motivating and fascinating for pupils in the secondary school. The concept of fractals is based on the deeper understanding of complex numbers and functions and is because of that on a high level for students at school. Nonetheless are there numerous of possibilities to introduce fractals in school. I for myself had in my math courses in the 13 grade a project about fractals, which showed for me the beauty of complex and advanced mathematics. When the students understood the basic structures of fractals they can easily manipulate the complex functions in a way to

create different and beautiful images of Julia sets and fractals. Mandelbrot in his work introduced the fractals and inspirited and motivated peoples like me for this kind of mathematics and has to be highly honored for this.

There are numerous possibilities for the use of computational methods to work with fractals. The easiest way to understand the concept of fractals is using a zooming application in the internet. There're numerous different of this applications in the internet, where the students can zoom in the fractal to discover the repeating structures that appear in, for example, the apple man that was discovered by Mandelbrot. An example of these programs can be found here: http://neave.com/fractal/ . But this is not the only possibility to use computers in discovering fractals. There are programs, with which the students can create different fractals. There they can change the underlying function of the fractal and can explore the Julia set for different complex points. With this program the students can discover abilities of fractals by studying different kinds of fractals, as the snowflake fractal.

The massage about Mandelbrot is an example of the usage of mathematic forums because it's shows that it's a place where information's can be shared. Users get informed about mathematical activities and actions around the world. They can find inspirations for studying other kinds of mathematic fields than they usually do. Reading this massage about the person of Mandelbrot for example can be the way that people get in touch with fractals; it could be an impulse for people to go deeper in the material. For students that are interested in mathematics and solving problems are getting the possibility to discover new fields of mathematical studies that they probably don't get taught in school. This is a very open way of using these forums in school, but it is a general purpose to enable the students in school to develop their own interests.

2)

Caros amigos:

Em mais um serviço de "utilidade pública" do EMFoco, segue uma lista de Eventos que ocorrerão em 2012 ligados a Educação Matemática, Educação e Matemática. Atualizem seus sites, seus quadros de avisos, se programem e participem!

Visitem sempre a página de eventos do Grupo EMFoco, pois estamos em constante atualização.

Caso sua Instituição esteja programando algum outro evento, comunique-nos, para que possamos atualizar e divulgar esta lista.

Abraços,

Do sempre amigo

José Walber de Souza Ferreira

Presidente do Grupo de Estudos EMFoco

This message contains a list of mathematical events taking place in different countries around the world. The main topic, the date and the website of every event is given in the post. Nearly all of these events have a mathematical background but differ in their main topic and purpose. Some are related to a special mathematical field like geometry or topology, some meetings are about mathematics and education and other ones are just meetings for mathematicians from different regions. There are also some events that are not mathematic related but still of interest, because they are for example about methods of teaching at school.

I am interested in this message because exchanging thoughts and ideas is one of the most important things in a science. In this kind of events the people can practice this exchange and gain new ideas, impulses or interests. They can meet other people that share the same passions and can increase their work. These events too are having the purpose to present new ideas and theories that are checked by the scientific society. All in all these events play a huge role in the field of mathematics. The educational meetings are important to exchange new ideas of teaching a subject and present new methods or knowledge gained by fundamental researches about teaching or learning psychology.

This post is an example of information's about events and meetings in real live. This is an important aspect of internet forums, which main purpose is the exchange of information and the connection of peoples sharing the same interests. Events and meetings of people arguing and discussing a special theme are serving the same purpose and are because of that very similar to the work an internet forum. Forums nowadays are an easy possibility to get in touch with people, getting hints for unsolved problems. But the exchange on a forum is limited by the form of

communication and cannot replace meetings and events like these given in the message.

For students it means that they have a lot of possibilities to meet people from different cities, countries or continents, with the same or new interests to exchange thoughts and by doing that develop themselves. This is not really an application for teaching mathematics in the school but is nonetheless of importance. Schools should enable their pupils to go to such events as shown in the post; of course discussing a subject that is appropriate to their skills. There are a lot of meetings where young people learn solving mathematic problems, train for mathematic contests and similar things.

Summary

Forums in the internet are normally serving for sharing information's and thoughts. Because of that the usage of forums in lessons is, on the one hand, not directly profitable but on the other hand a huge chance for pupils to deepen their horizons, meeting people, discover new fields of mathematics, get help to solve problems, find information's and so on. That's why a teacher at school should enable the students to have excess to this kind of forums and for example show them some recommended ones.