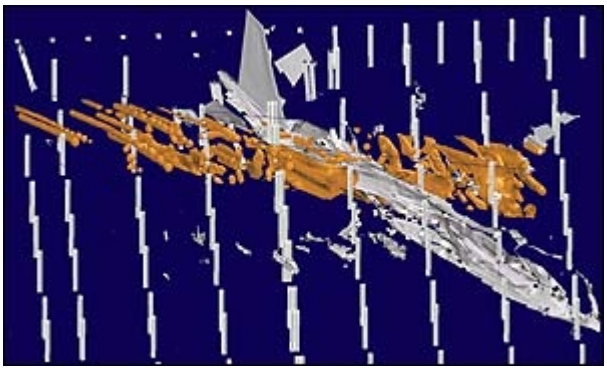
Friday, 13 September, 2002, 10:57 GMT 11:57 UK

Computer clues to Pentagon attack



Orange shows fuel onboard as the plane crashed

A computer simulation of the attack against the Pentagon last September could be used to design buildings that can withstand terrorist attacks.

The software used principles of physics to show how the plane's huge mass of fuel and cargo impacted the building.

It could help design buildings such as hospitals and fire stations that would be more resistant to similar attacks.

It was designed by engineers and computer scientists at Purdue University in the US state of Indiana.

Mathematical model

Computer science professor Christoph Hoffmann said the simulation could play a vital role in future.

> **At that speed, the plane itself is like a sausage skin**
>
> **Professor Mete Sozen, Purdue University**

"We hope that through such simulation we can learn from this tragic event how to protect better the lives of our citizens and the civil infrastructure of the nation," he said.

The model shows that it was not the plane's structure that caused the damage to the building.

"At that speed, the plane itself is like a

News Front Page
Africa
Americas
Asia-Pacific
Europe
Middle East
South Asia
UK
Business
Entertainment
Science/Nature
Technology
Health
Talking Point
Country Profiles
In Depth
Programmes
BBC SPORT
BBC WEATHER
SERVICES
Daily E-mail
News Ticker
Mobile/PDAs
Text Only
Feedback
Help
EDITIONS
Change to UK

SEPTEMBER 11
ONE YEAR ON
Special report
New York despatches
Looking to the future
Giuliani reflects
Firefighter's widow
Sharing the pain
World remembers
IN DEPTH
How the world changed
Investigating al-Qaeda
Where were you when?
Day of terror
In pictures
TALKING POINT
Did media get it right?
FORUM
Anniversary questions
INTERNET LINKS
Background information
AUDIO VIDEO
America remembers
Round-up of the day

See also:
11 Sep 02 | Technology
E-mail virus exploits September 11
17 Sep 01 | Entertainment
Towers removed from simulator
30 Jun 00 | Science/Nature
Supercomputer to simulate bomb tests

Internet links:
Purdue News

The BBC is not responsible for the content of external internet sites

Top Technology stories now:
Playstation 2 is 'console champion'
State of the wireless nation
Nintendo fined for price fixing
Radio gives power to the people

sausage skin," said Professor of Structural Engineering, Mete Sozen.

"It doesn't have much strength and virtually crumbles on impact."

Instead the combined mass of everything inside the plane, particularly the fuel, that had the effect of a huge river crashing into the Pentagon.

Lengthy process

Professor Sozen first created a mathematical model of the reinforced concrete columns which supported the Pentagon building.

This was turned into a simulation, representing the plane as thousands of small squares containing specific physical characteristics.

It was a laborious process. Creating just one-tenth of a second of the simulation took about 95 hours of computation time on a supercomputer.

It was important to the scientists to represent both the plane and the Pentagon realistically as well as being true to physics.

The result has pleased all involved in the project.

"This is going to be a tremendous asset," said Professor Sozen.

"Eventually, I hope this will be expanded into a model that we can use to help design structures to resist severe impact loads."

Virtual hands reach across the ocean
Islamic hackers step up attacks
Online shopping soars in Europe
Raids net bumper pirated games haul

Links to more Technology stories are at the foot of the page.

E-mail this story to a friend

Links to more Technology stories

In This Section Go

© BBC ^^ Back to top

News Front Page | Africa | Americas | Asia-Pacific | Europe | Middle East | South Asia | UK | Business | Entertainment | Science/Nature | Technology | Health | Talking Point | Country Profiles | In Depth | Programmes

To BBC Sport>> | To BBC Weather>> | To BBC World Service>>

© MMII | News Sources | Privacy