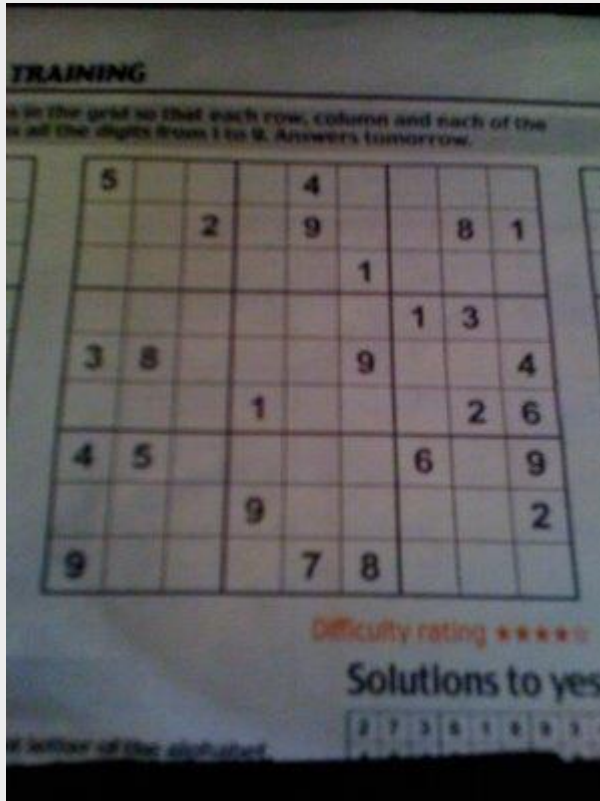


APPLICATIONS OF COMPUTER GRAPHICS

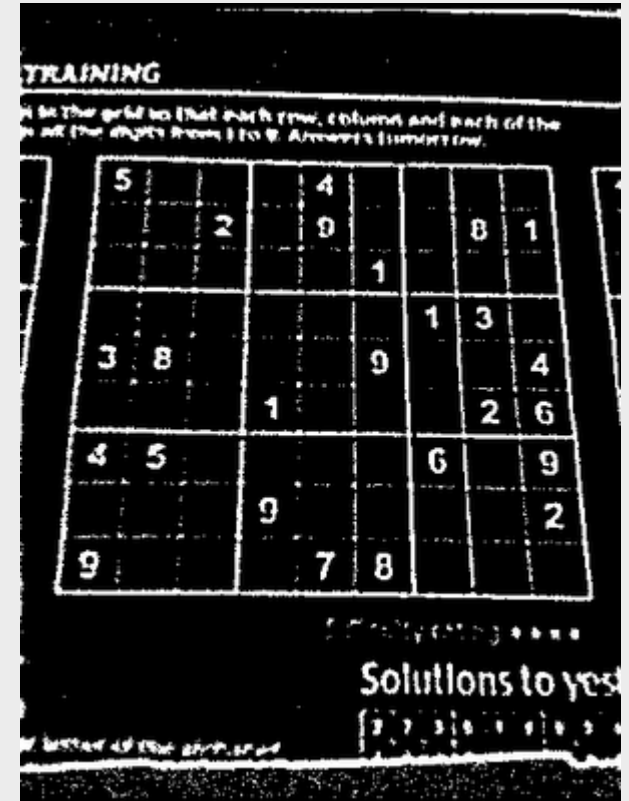
COMPUTER VISION

COMPUTER VISION EXAMPLE

IMAGE PROCESSING

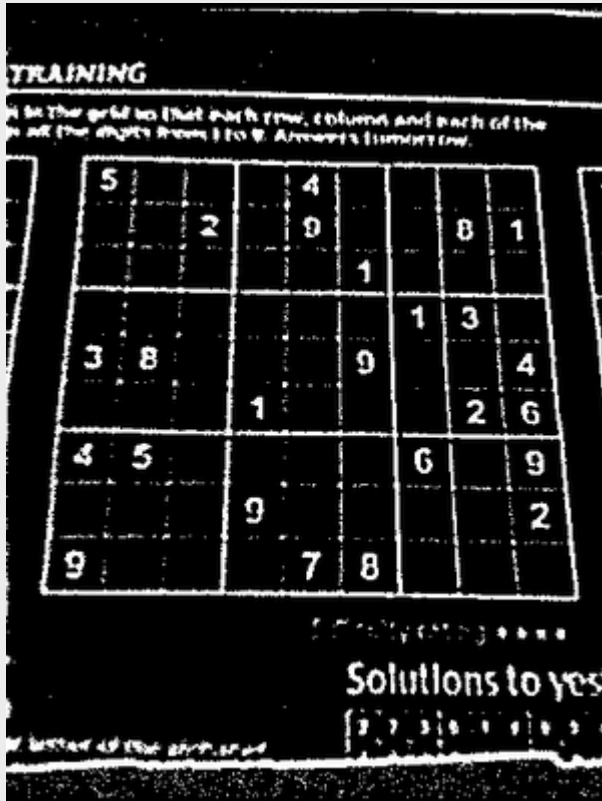


Adaptive
threshold

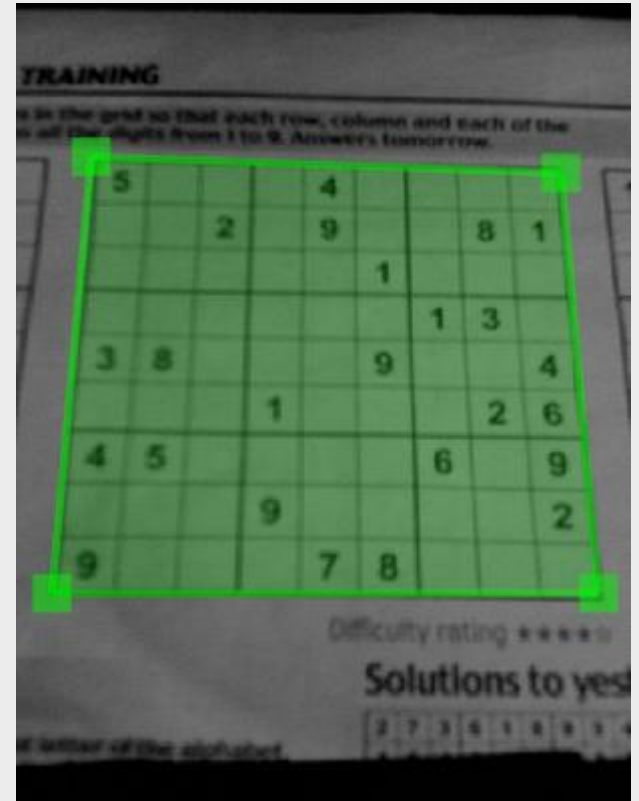


COMPUTER VISION EXAMPLE

PATTERN RECOGNITION



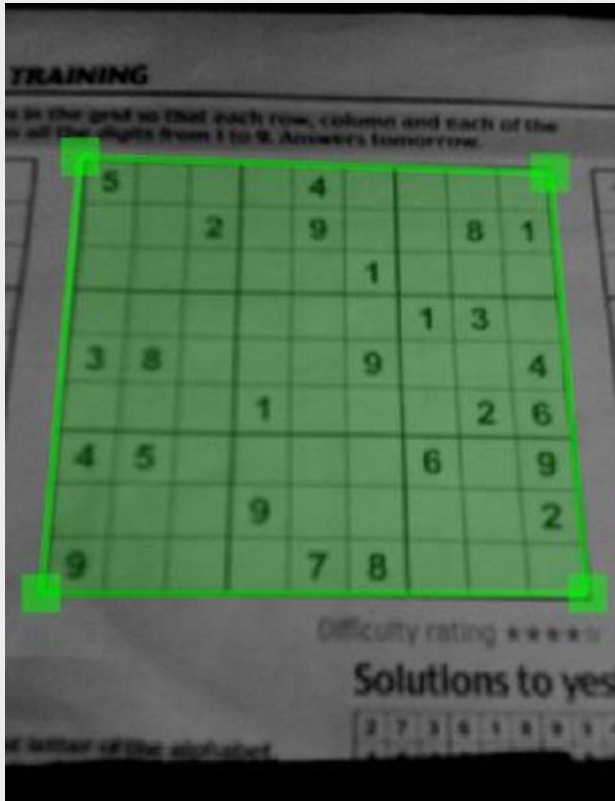
Hough transform



<http://sudokugrab.blogspot.com>

COMPUTER VISION EXAMPLE

NORMALIZATION



Perspective
transformation



<http://sudokugrab.blogspot.com>

COMPUTER VISION EXAMPLE

CLASSIFICATION

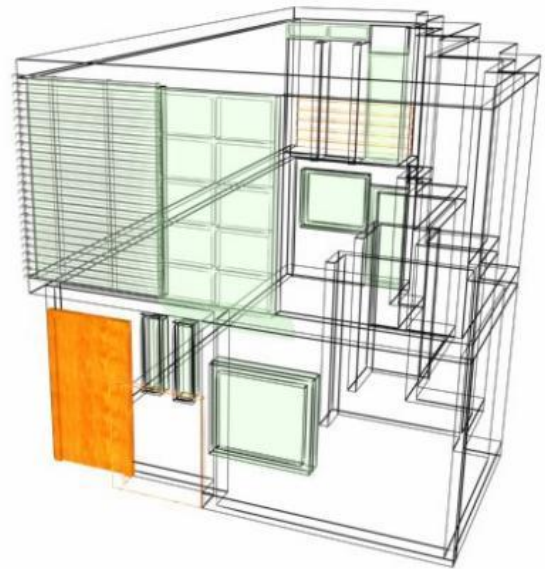
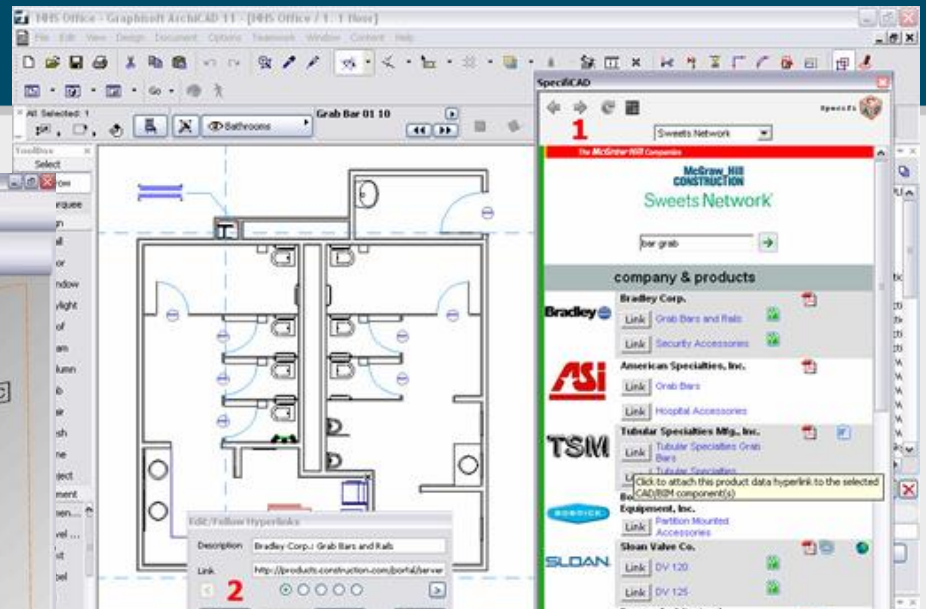
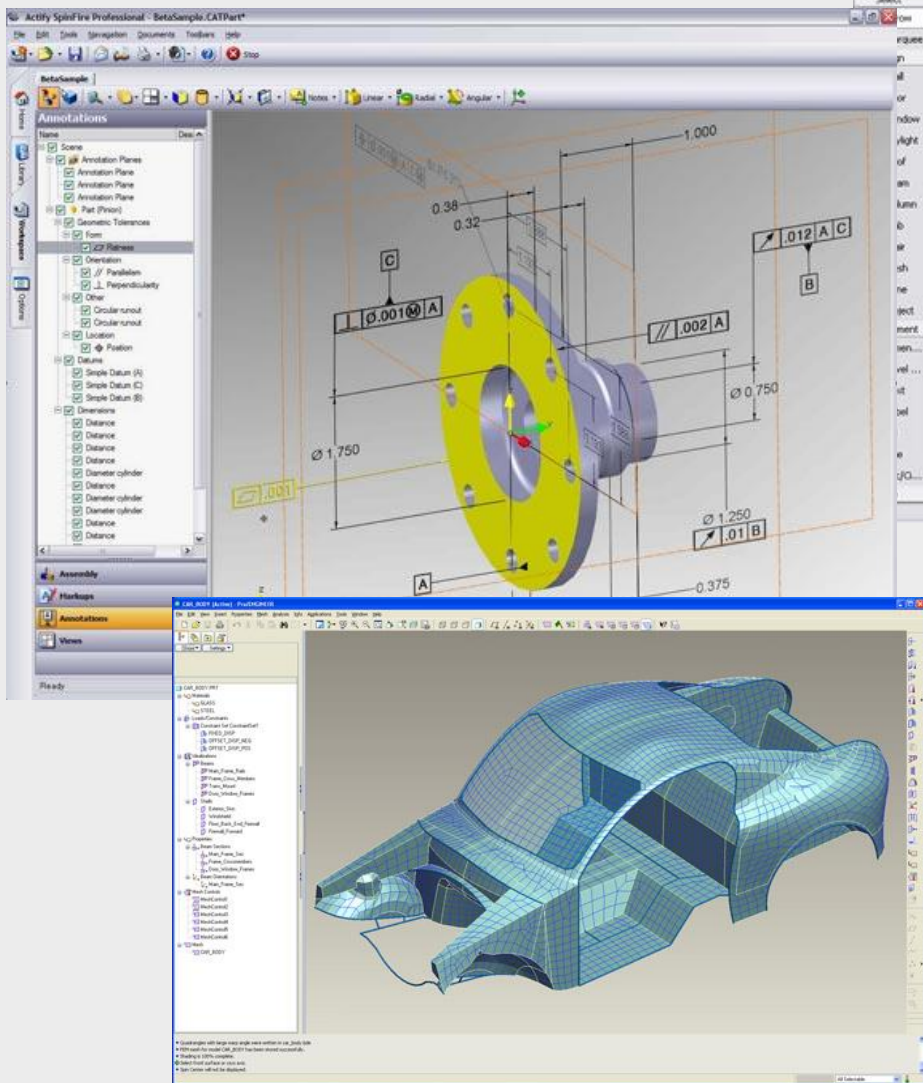


Neural network
OCR

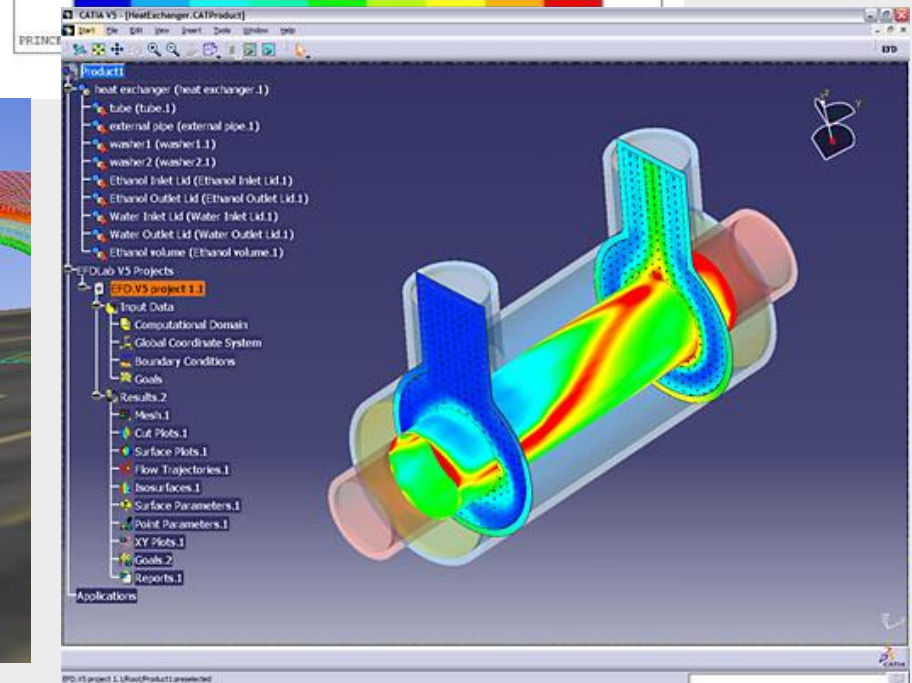
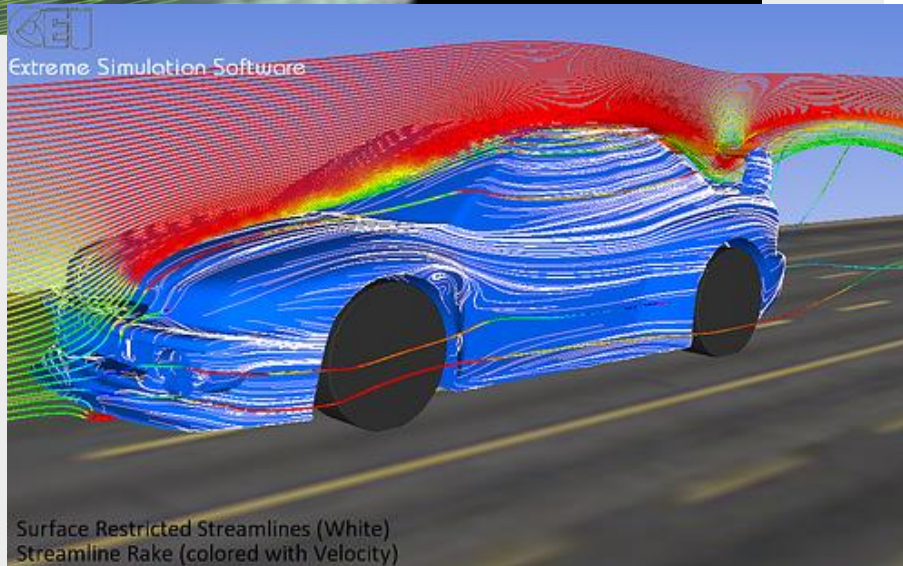
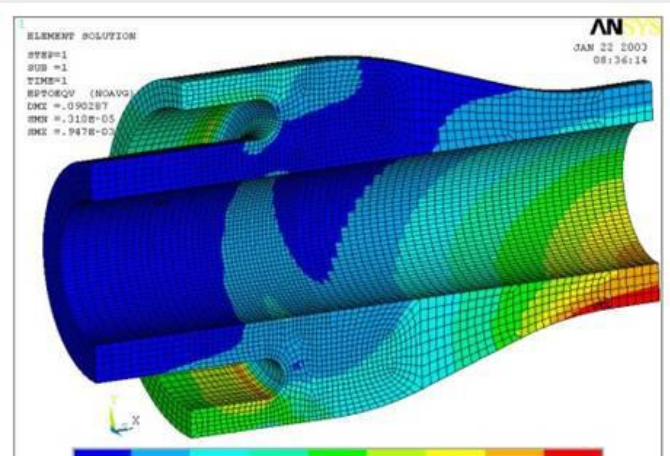
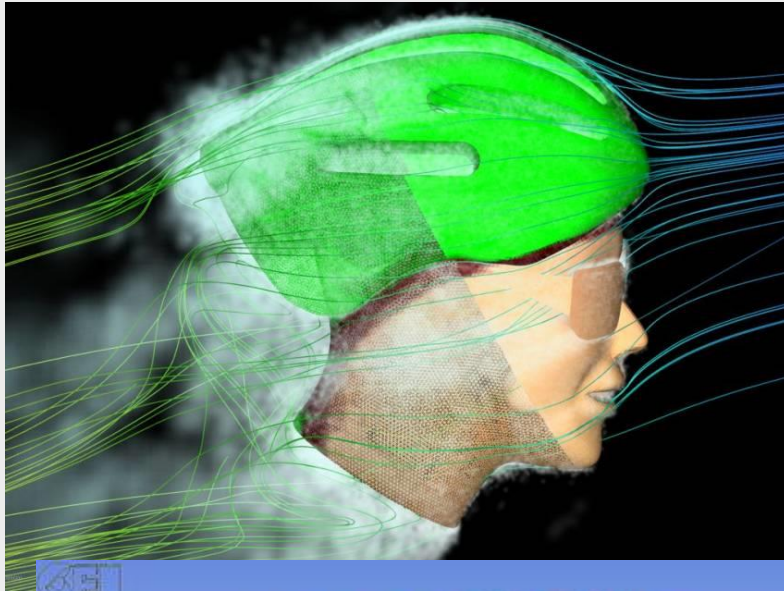


COMPUTER AIDED DESIGN (CAD)

MODELING



SIMULATION (OPTIONAL)



VISUALIZATION



MANUFACTURING - CNC

2-AXIS

3-AXIS

5-AXIS

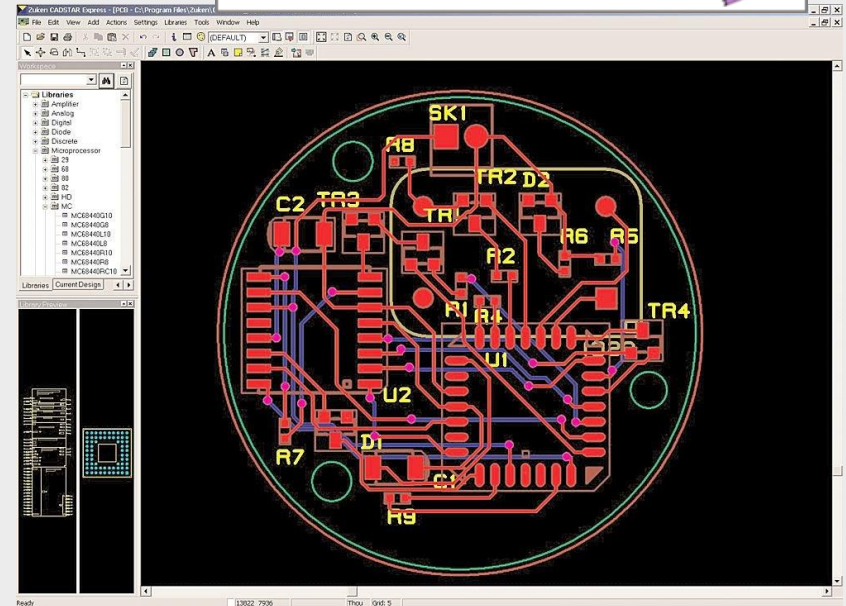
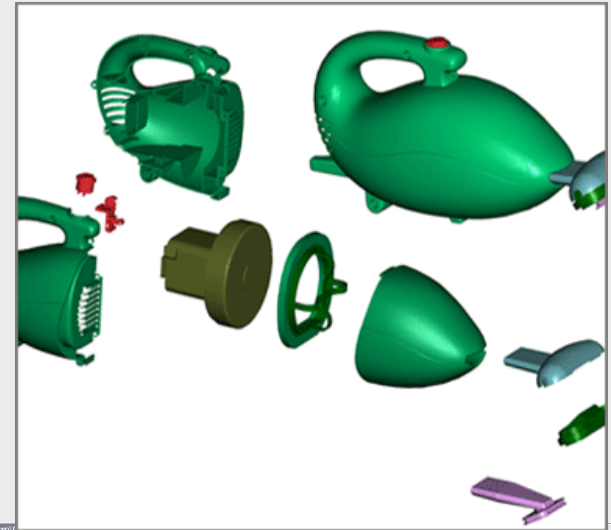
...



ARCHITECTURE
PRODUCT DESIGN
INDUSTRIAL DESIGN
ENGINEERING

Construction parts

Circuitry



CAD SOFTWARE

AUTOCAD

~5000 €

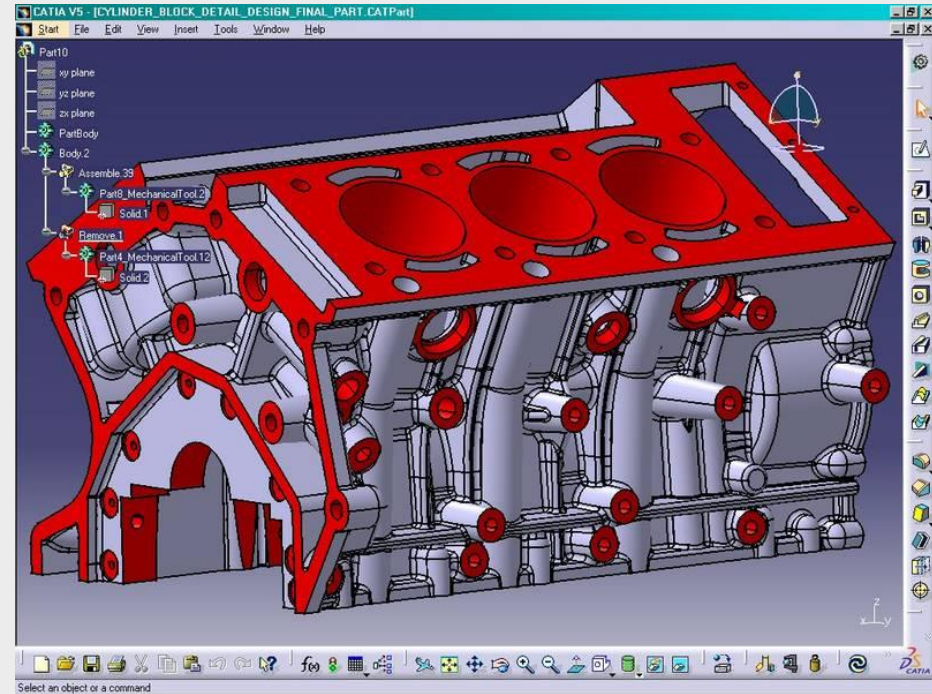
ARCHICAD

~5000 €

CATIA

~15.000 €

CREO PARAMETRIC
(PRO/ENGINEER)



RENDERERS EITHER INTERNAL OR 3RD PARTY

RENDERERS

INTERNAL CAD
RENDERERS

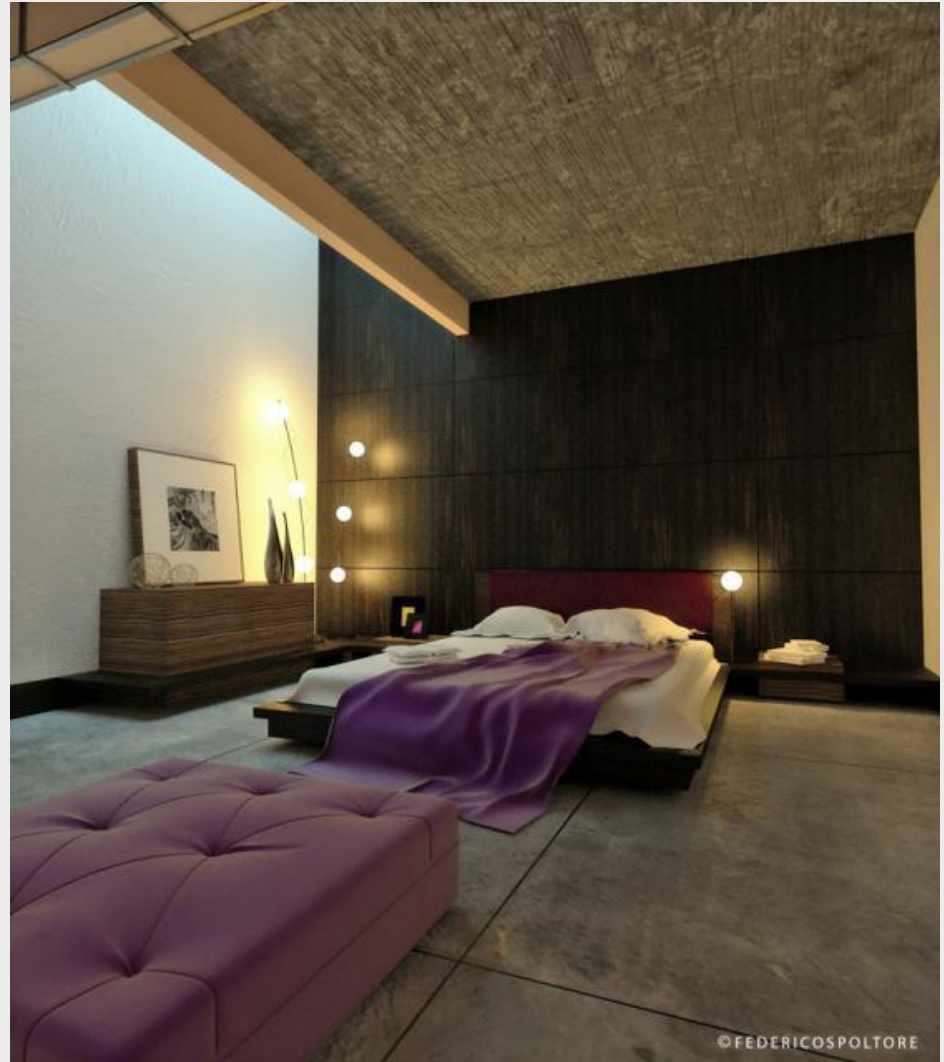
Often low quality

MAXWELL

VRAY

3DS MAX
MAYA

...



VISUALIZATION

MEDICAL VISUALIZATION

VOLUME DATA

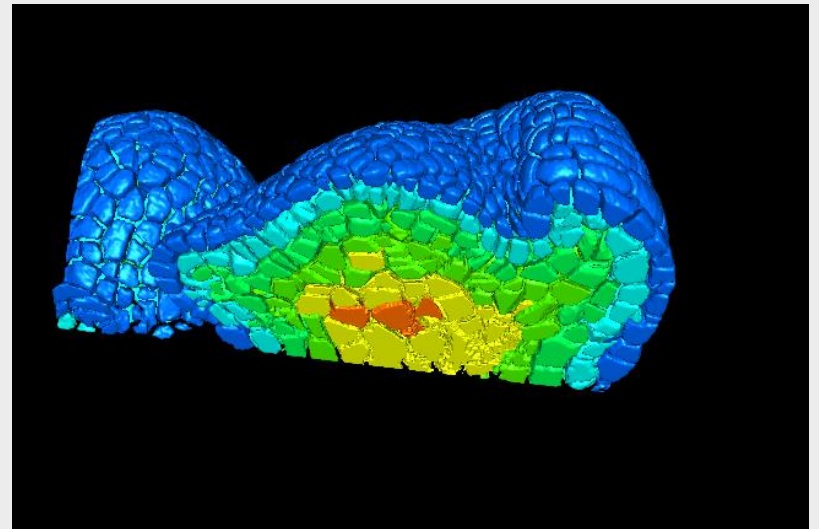
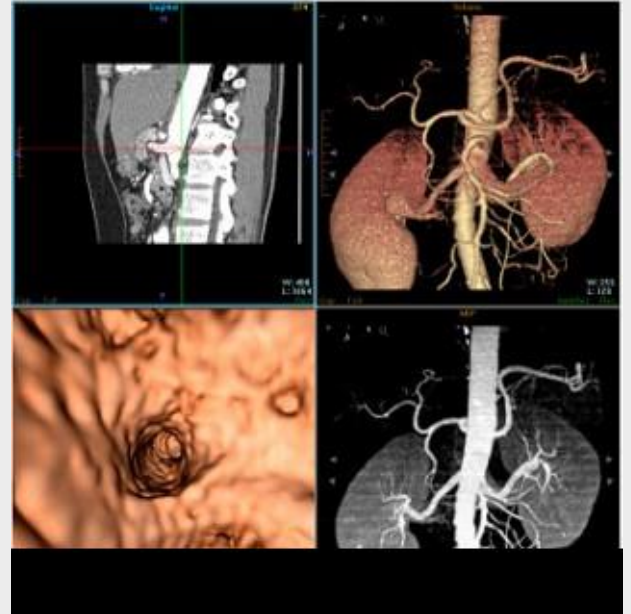
CT, MRI, FMRI

CONFOCAL MICROSCOPY

COMPANIES:

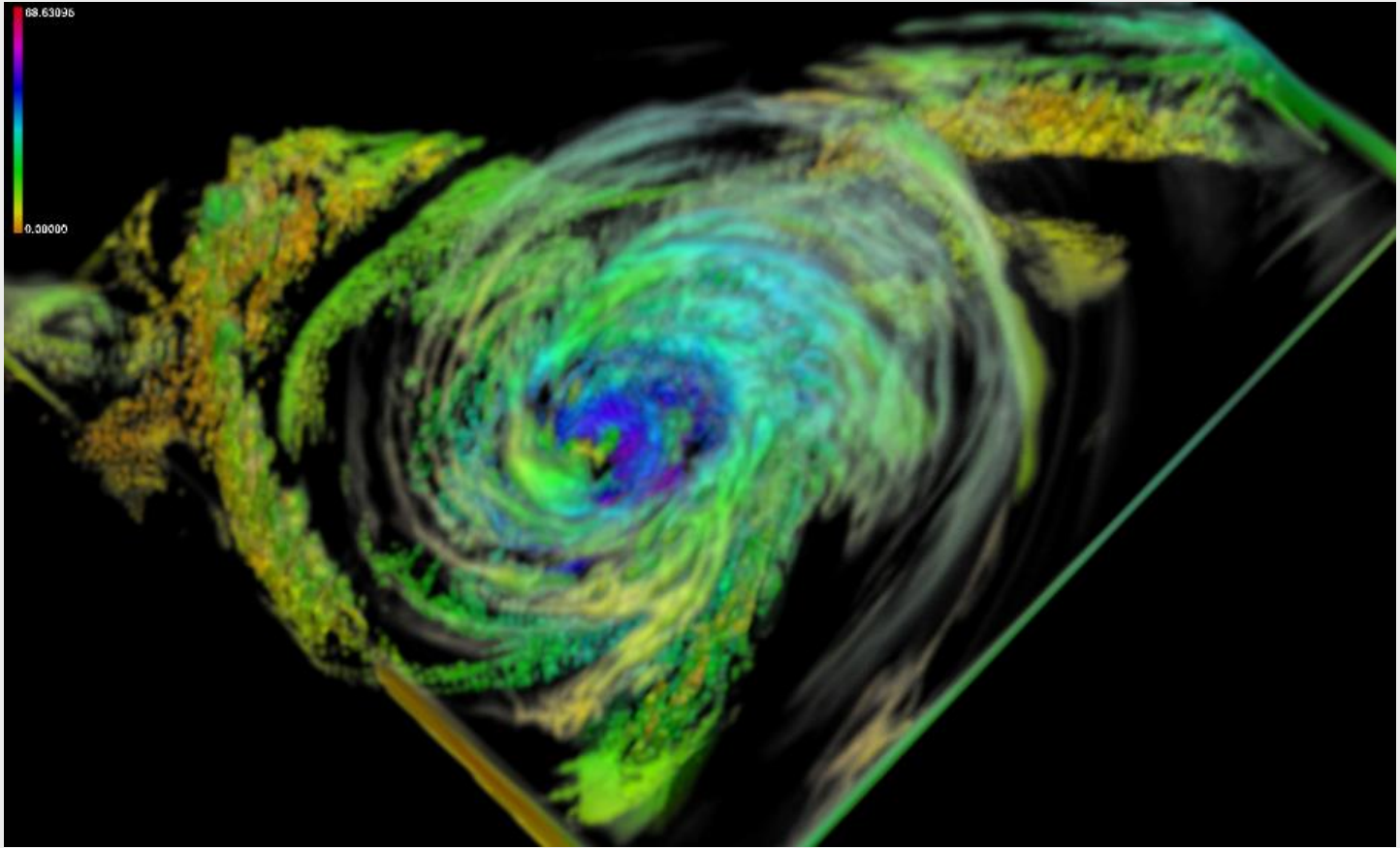
Siemens, Toshiba,

Olympus, ...

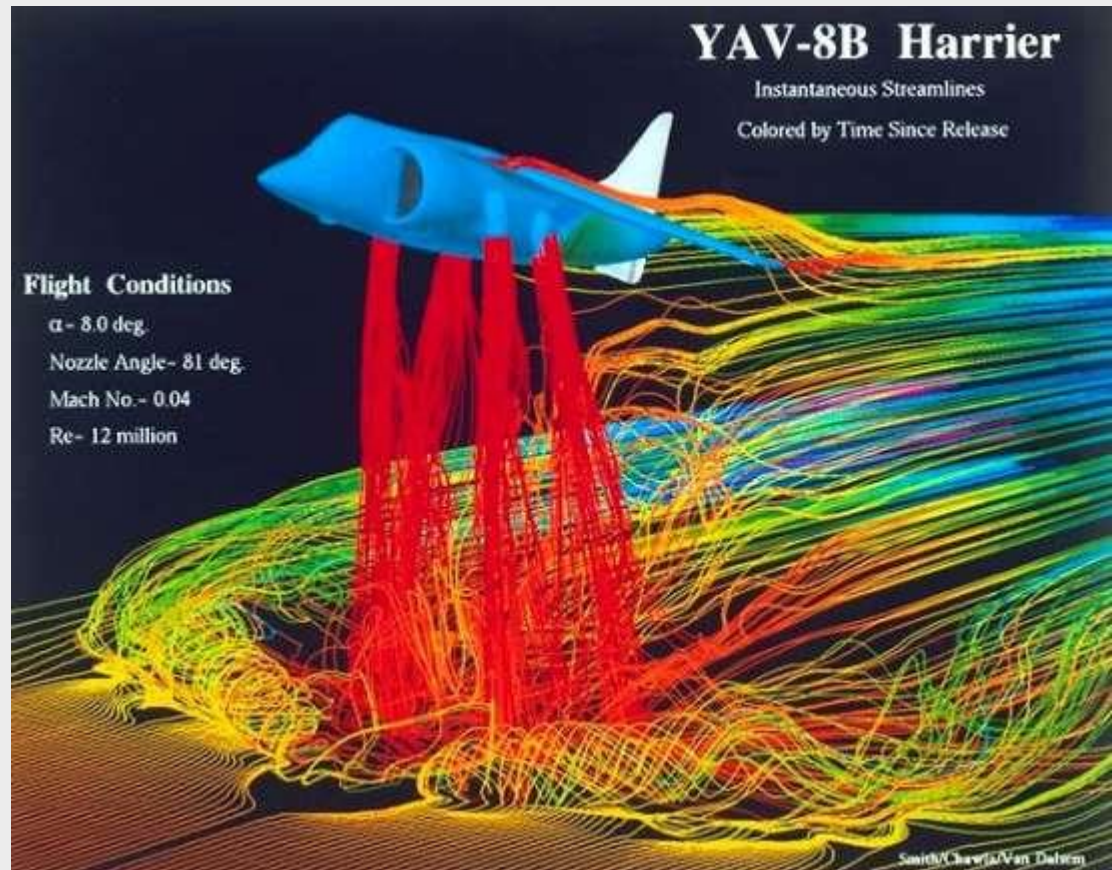
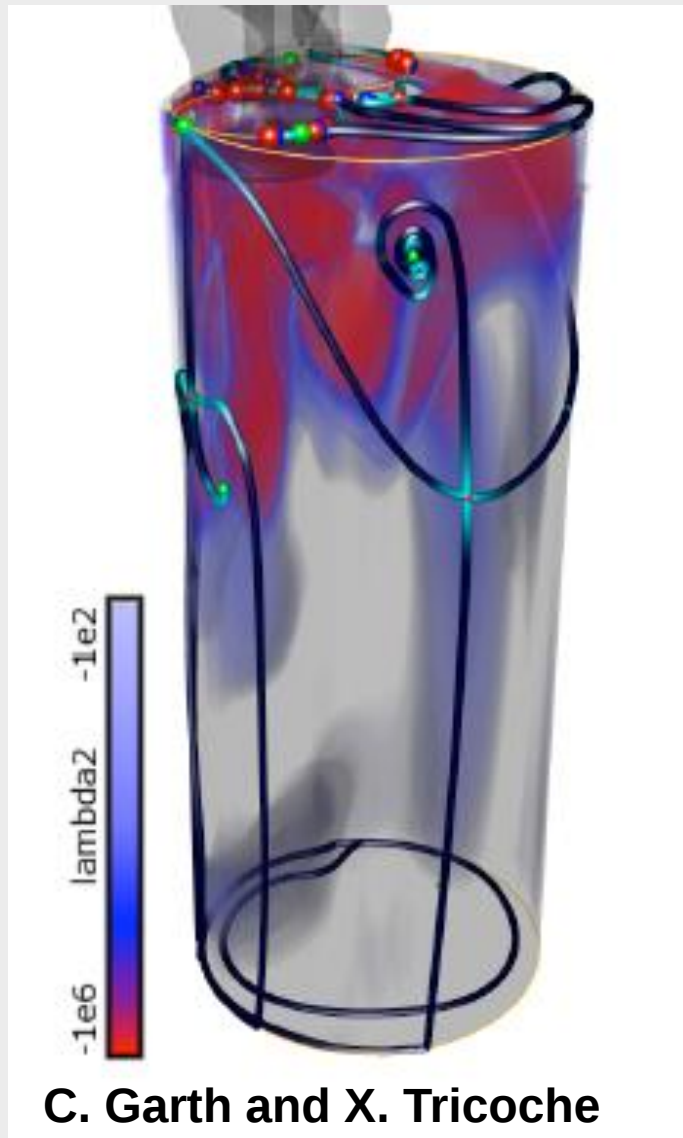


VOLUME VISUALIZATION

E.G. METEOROLOGY



FLOW VISUALIZATION



www.aerospaceweb.org

INFORMATION VISUALIZATION

ABSTRACT MULTIDIMENSIONAL DATA

DETECT EXPECTED, DISCOVER UNEXPECTED

RELATIONS, TIME-DEPENDENT DATA, ...

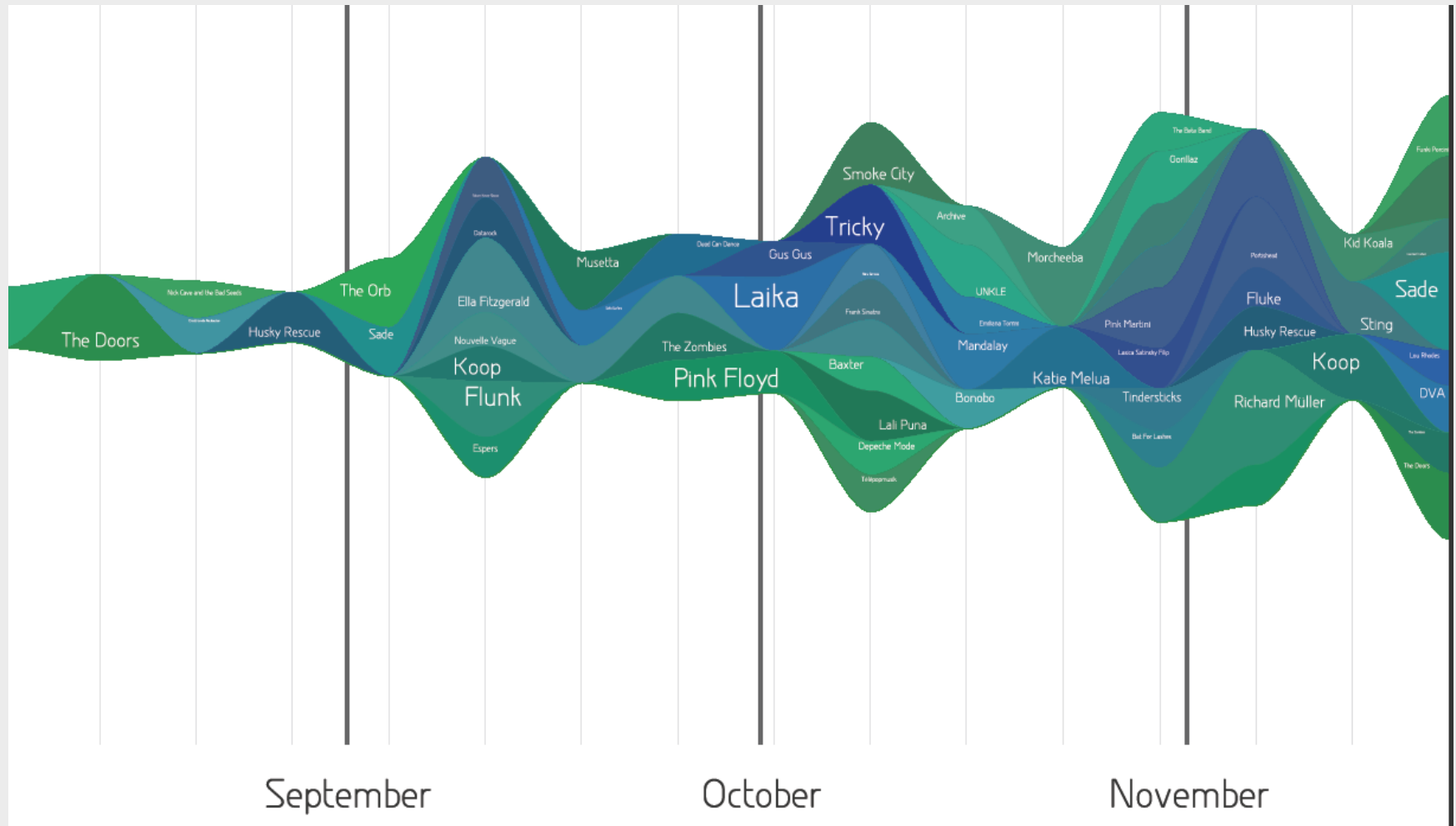
APPLICATIONS IN:

Economy

Nature sciences

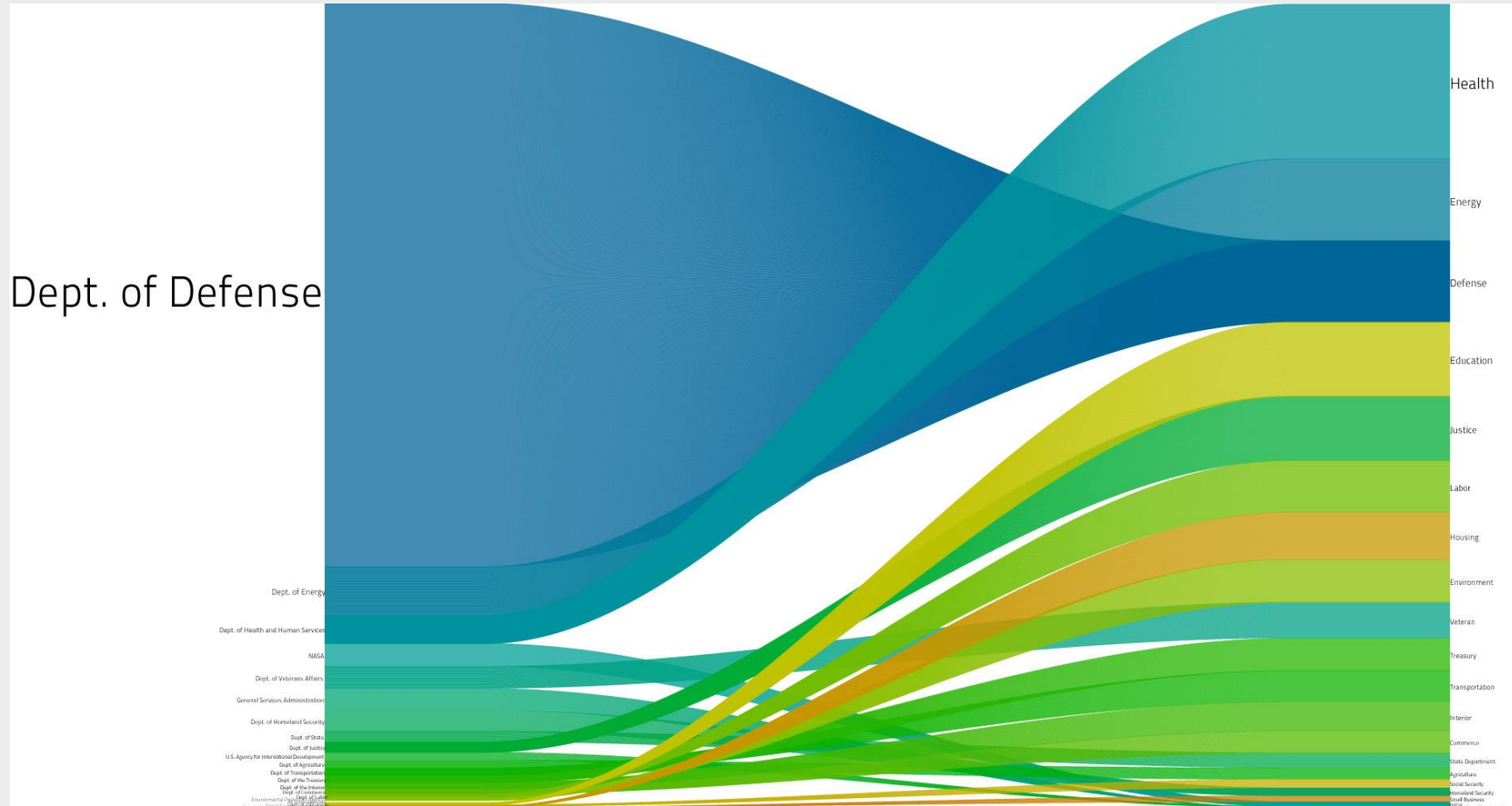
Social sciences

[HTTP://LASTGRAPH.AERACODE.ORG/](http://lastgraph.aeracode.org/)



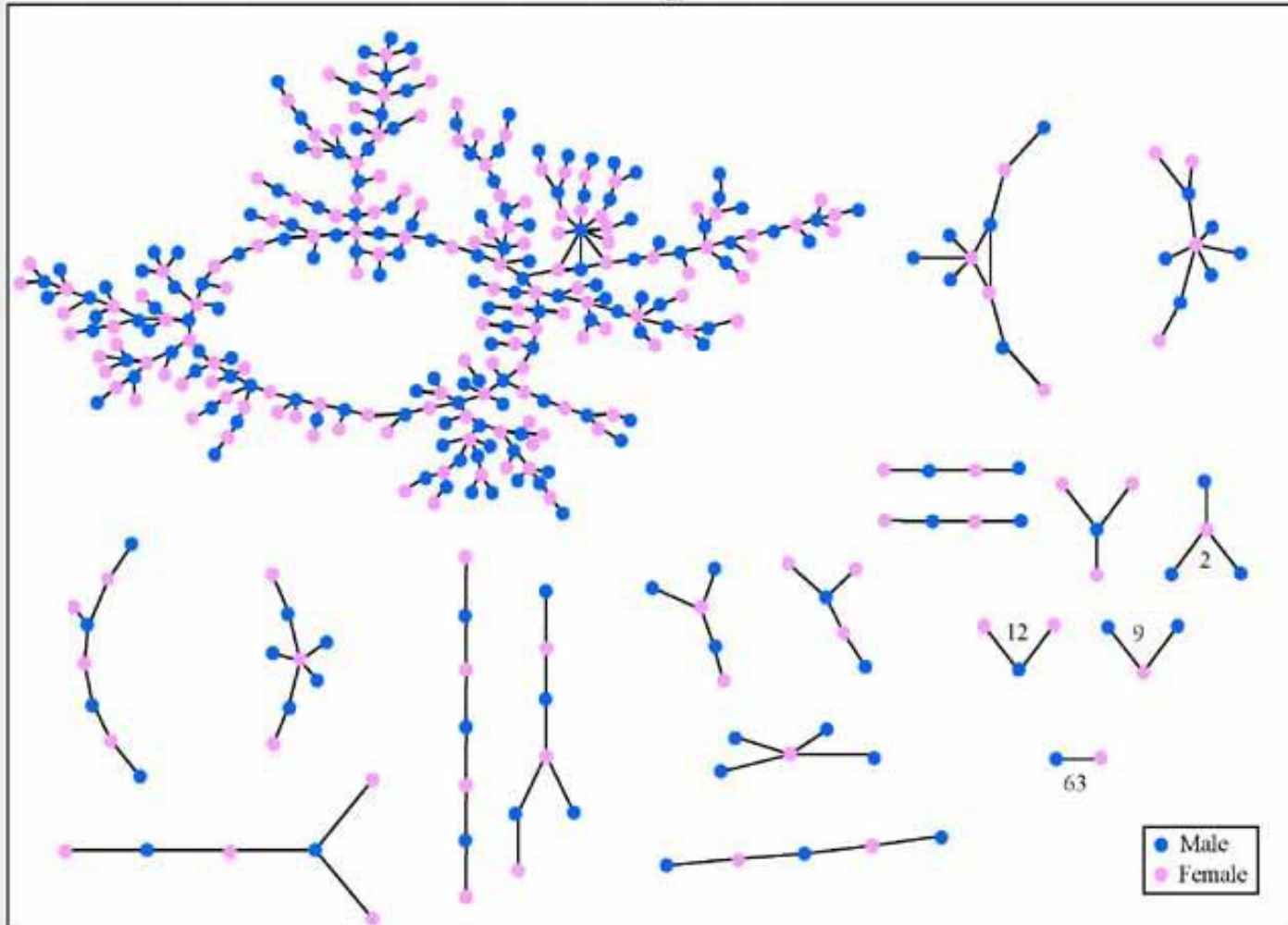
INFOVIS EXAMPLES

WWW.PITCHINTERACTIVE.COM/USBUDGET



INFOVIS EXAMPLES

The Structure of Romantic Relations at "Jefferson High School"



INFOVIS SOFTWARE

SPOTFIRE

subscription

~300 € /month

TABLEAU

~1500 €

MICROSTRATEGY

QLIKVIEW

...



COMPUTER GAMES

GAME ENGINE

3D RENDERING

NETWORK COMMUNICATION

SCRIPTING, GAME MECHANICS

ARTIFICIAL INTELLIGENCE

PHYSICS



CRYENGINE 3

UNREAL ENGINE 4

UNITY, SOURCE, CREATION ENGINE, ...



IT IS AN INDUSTRY

ANNUAL SALES ~ 20 BILLION \$ (MOVIES ~ 30)
AVATAR (2009 MOVIE) ~ 2 BILLION \$



Budget ~	100 mil	100 mil
Revenue ~	1000 mil	500 mil

btw. World of Warcraft ~ 1.4 billion \$ (yearly!)

RELATED HARDWARE

NINTENDO WII

~ 100 MIL PCS.

XBOX 360

~ 70 MIL PCS.

PLAYSTATION 3

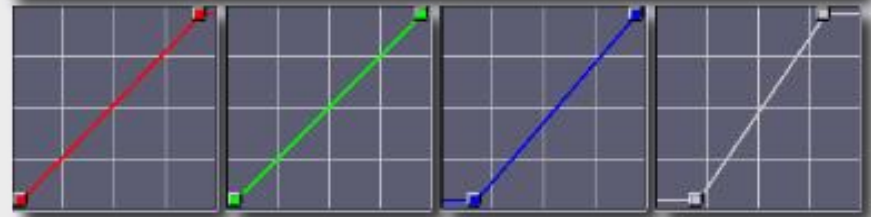
~ 70 MIL PCS.

NEW : XBOX ONE, PLAYSTATION 4



VIDEO PROCESSING

COLOR GRADING



<http://www.openmovieeditor.org>

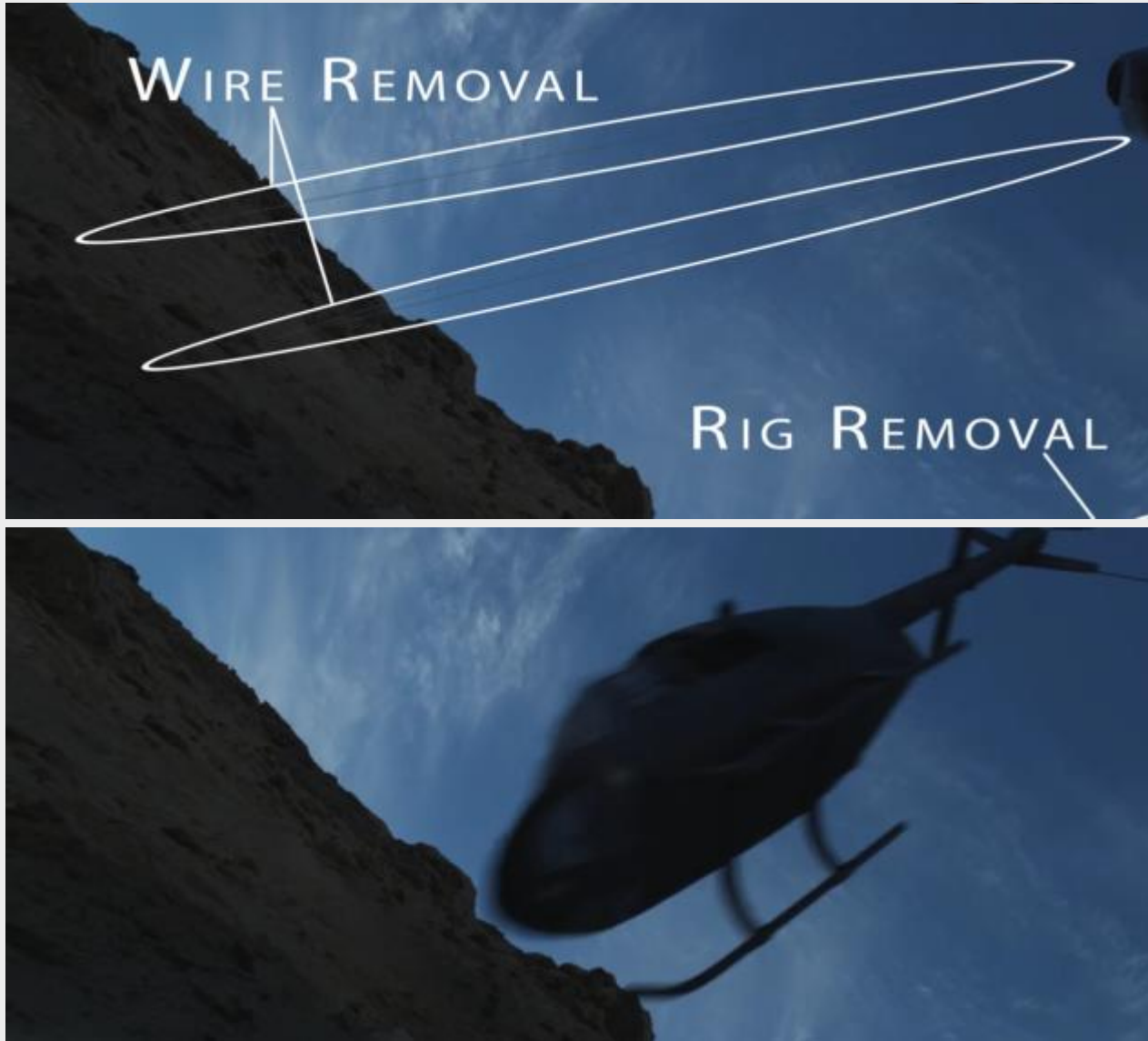
CHROMA KEY



COMPOSITING



RIG REMOVAL



MATTE PAINTING



COMPUTER-GENERATED IMAGERY

VIRTUAL OR HISTORICAL
ENVIRONMENTS

ANIMATED MOVIES

MONSTERS, CREATURES

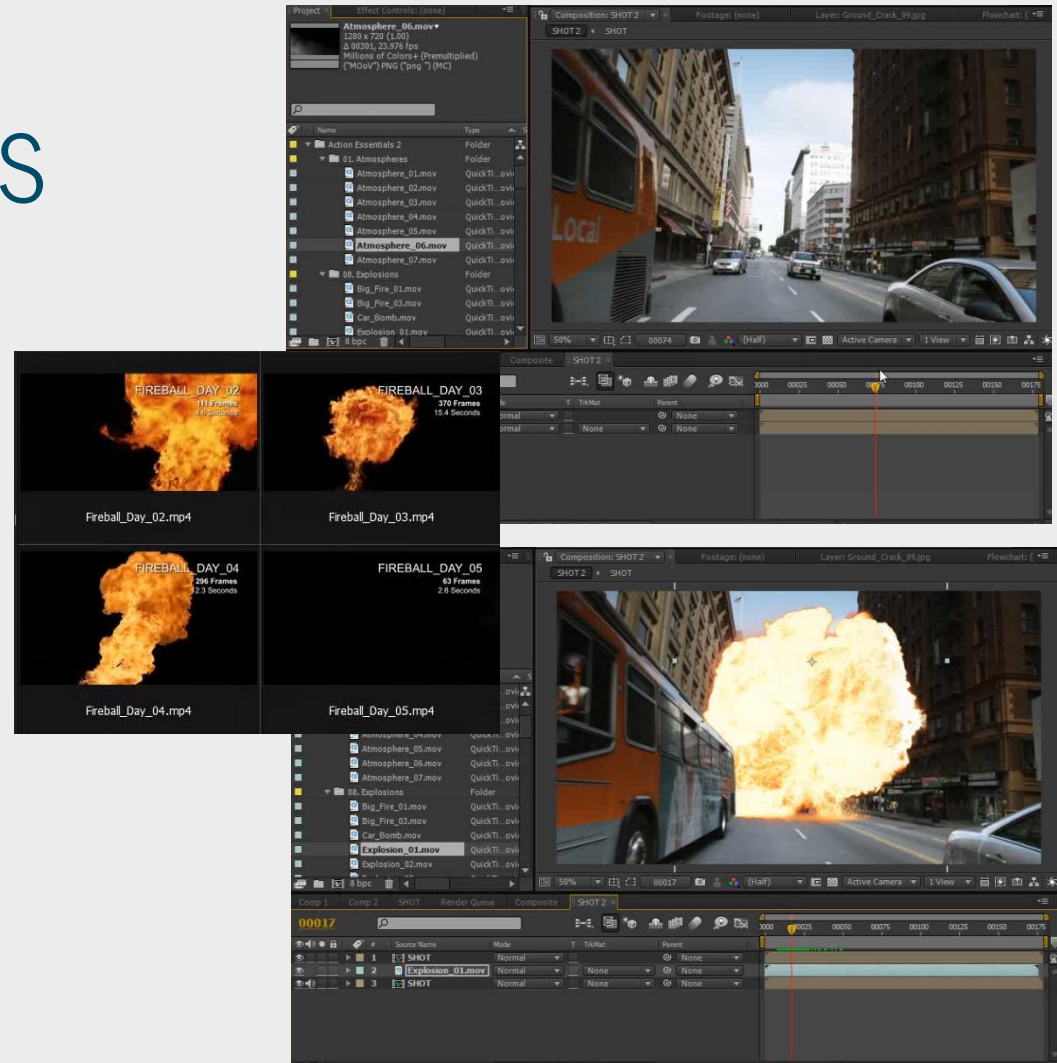


VIDEO COMPOSITING SOFTWARE

ADOBE:
AFTER EFFECTS

APPLE:
MOTION

AUTODESK:
SMOKE

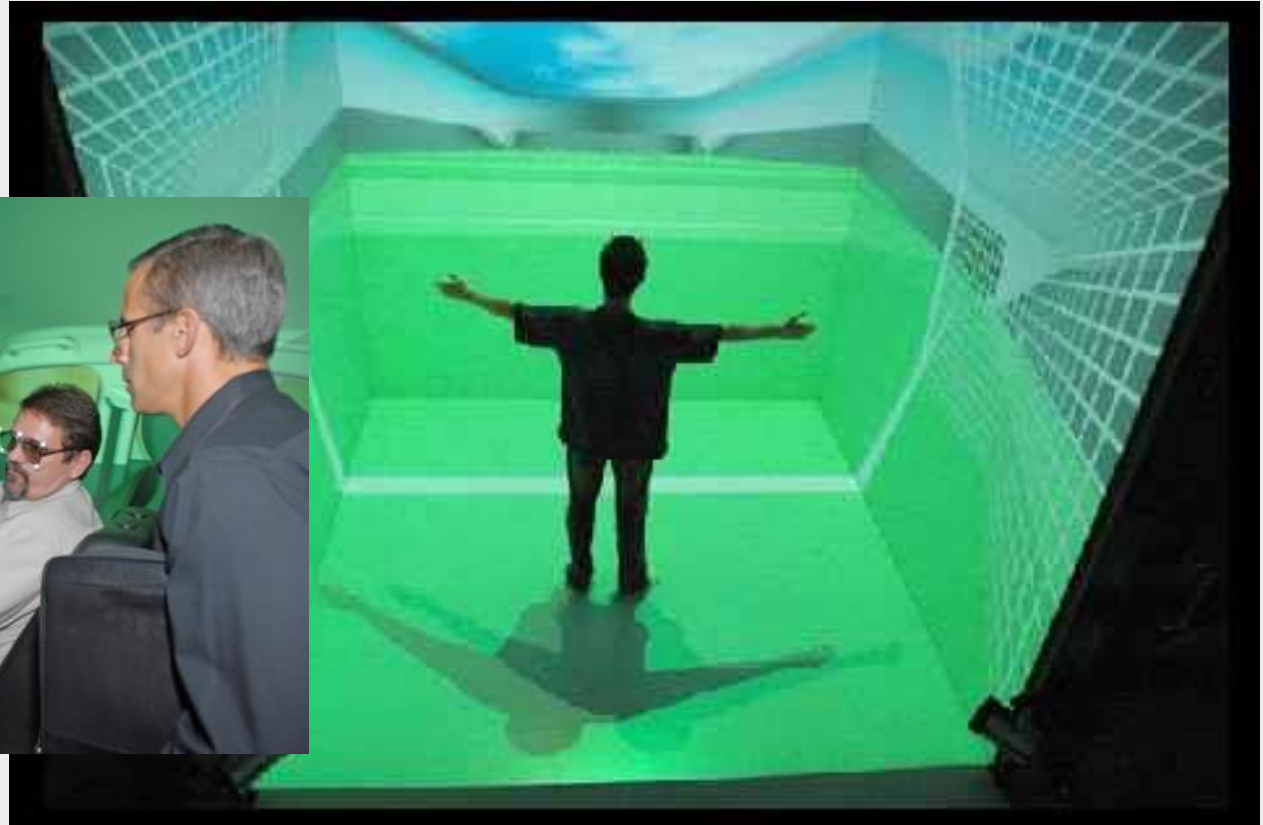


<http://www.videocopilot.net>

VIRTUAL REALITY AND AUGMENTED REALITY

VIRTUAL REALITY

SIMULATION, VISUALIZATION, VIRTUAL
TRAVELING
CAVE
HMD



AUGMENTED REALITY



APPLICATIONS

ENTERTAINMENT
MARKETING
PROTOTYPING
MEDICINE

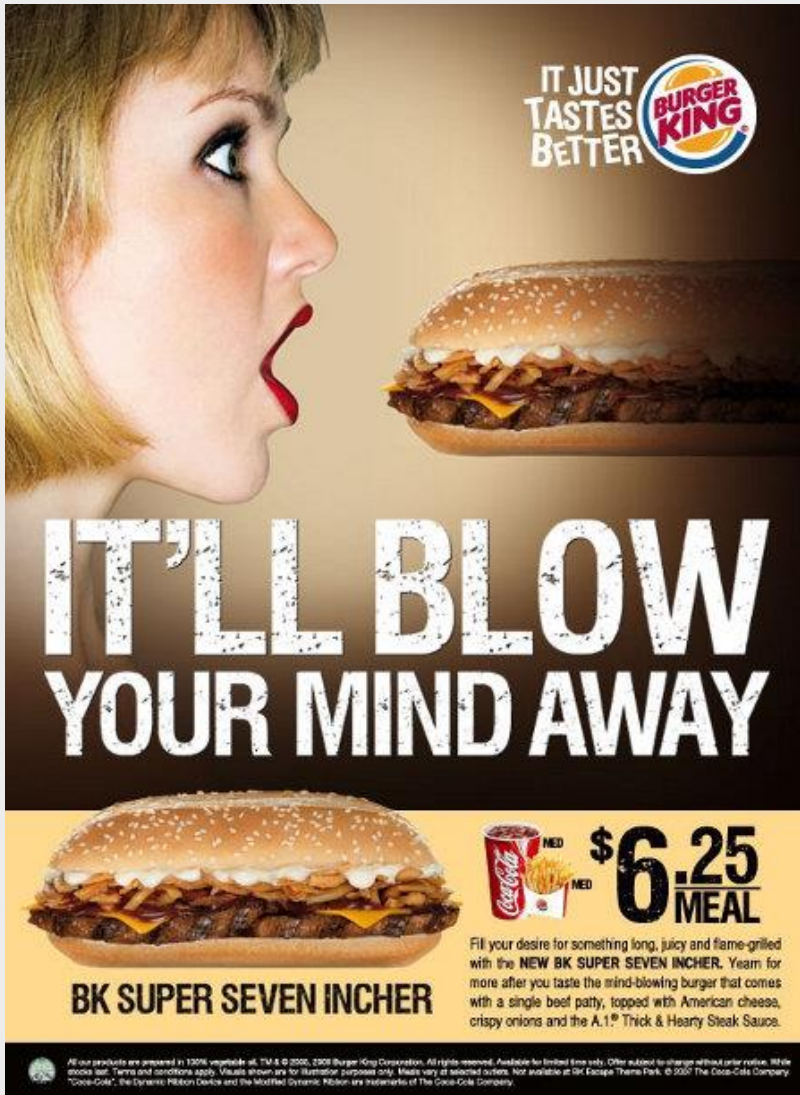


AR APPLICATIONS FOR PRESENTATION



DESKTOP PUBLISHING AND GRAPHIC DESIGN

GRAPHICS DESIGN



IT JUST TASTES BETTER 

IT'LL BLOW YOUR MIND AWAY

   **\$6.25 MEAL**

BK SUPER SEVEN INCHER

Fill your desire for something long, juicy and flame-grilled with the **NEW BK SUPER SEVEN INCHER**. Yearn for more after you taste the mind-blowing burger that comes with a single beef patty, topped with American cheese, crispy onions and the A.1.[®] Thick & Hearty Steak Sauce.

All our products are prepared in 100% vegetable oil. TM & © 2005, 2006 Burger King Corporation. All rights reserved. Available for limited time only. Offer subject to change without prior notice. While stocks last. Terms and conditions apply. Visuals shown are for illustrative purposes only. Menu vary at selected outlets. Not available at BK Escape Theme Park. © 2007 The Coca-Cola Company. "Coca-Cola", the Dynamic Ribbon Device and the Modified Dynamic Ribbon are trademarks of The Coca-Cola Company.

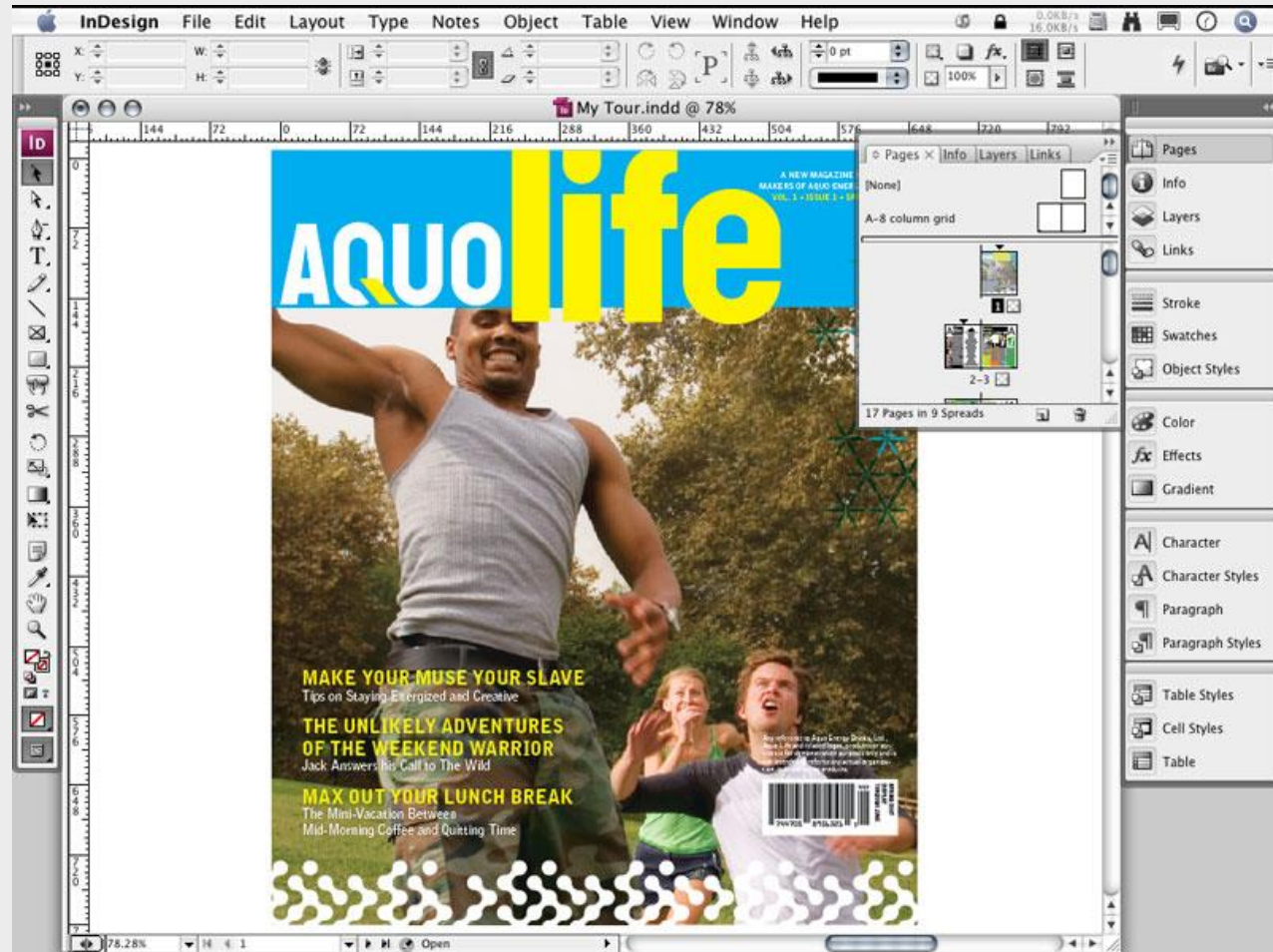
2D
POSTERS
BOOK COVERS
ADVERTISEMENTS
LOGOS
WEB PAGES

DESKTOP PUBLISHING

COMPOSITION OF TEXTS AND GRAPHICS FOR PRINT

MAGAZINES
BROCHURES
NEWSPAPERS

...



SOFTWARE

DTP

QuarkXPress ~ 1100 €

Adobe InDesign ~ 800 €

CorelDRAW ~ 550 €

GRAPHIC DESIGN

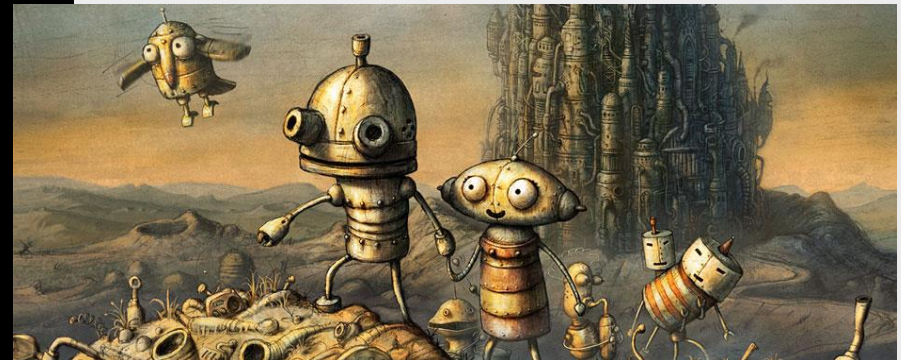
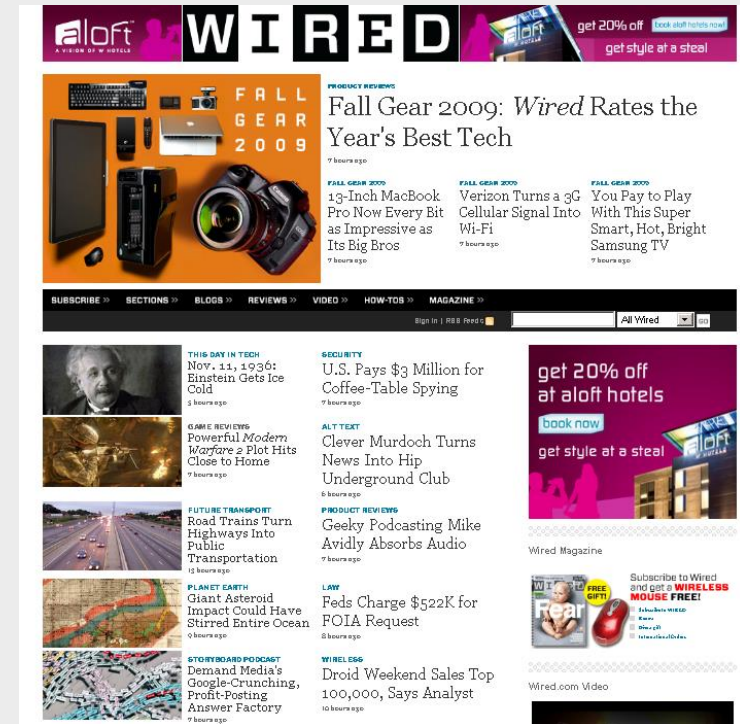
Adobe Illustrator ~ 650 €



WWW

WEB GRAPHICS

WEB DESIGN
FLASH / FLEX
RICH INTERNET APPS
HTML5, WebGL



NEXT:
ON DEMAND