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ATTORNEYS AT LAW



Protecting Software Innovations

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Overview

- ◆ Introduction to Intellectual Property Law
- ◆ Patent Protection for Software
- ◆ Copyright Protection for Software
- ◆ Other forms of IP Protection for Software
- ◆ Open Source Software
- ◆ University IP Policies
- ◆ Questions

Introduction to Intellectual Property Law

- ◆ Four Major Areas of IP Law:
 - Patents
 - Copyrights
 - Trademarks
 - Trade Secret
- ◆ Each Can Serve a Purpose in Protecting Software!

Patents

- ◆ What is a Patent?
 - Exclusive Right to Prevent Others from Making, Using, Selling, Offering to Sell, or Importing the Patented Invention
 - Quid-pro-quo: Disclosure of Invention to Public in Exchange for Limited Monopoly
 - Most Common Types of Patents:
 - Utility
 - Design

Patents

- ◆ Utility Patents
 - Protect the way an invention works
 - Term of Protection: 20 Years (measured from earliest effective U.S. filing date)
 - Two Types: Provisional or Non-Provisional
 - Utility Patents Can Protect Software

Patents

(12) **United States Patent Ording**

(10) **Patent No.:** US 7,469,381 B2
(45) **Date of Patent:** Dec. 23, 2008

(54) **LIST SCROLLING AND DOCUMENT TRANSLATION, SCALING, AND ROTATION ON A TOUCH-SCREEN DISPLAY**

(75) Inventor: **Bas Ording**, San Francisco, CA (US)

(73) Assignee: **Apple Inc.**, Cupertino, CA (US)

(57) **ABSTRACT**

In accordance with some embodiments, a computer-implemented method for use in conjunction with a device with a touch screen display is disclosed. In the method, a movement of an object on or near the touch screen display is detected. In response to detecting the movement, an electronic document displayed on the touch screen display is translated in a first direction. If an edge of the electronic document is reached while translating the electronic document in the first direction while the object is still detected on or near the touch screen display, an area beyond the edge of the document is displayed. After the object is no longer detected on or near the touch screen display, the document is translated in a second direction until the area beyond the edge of the document is no longer displayed.

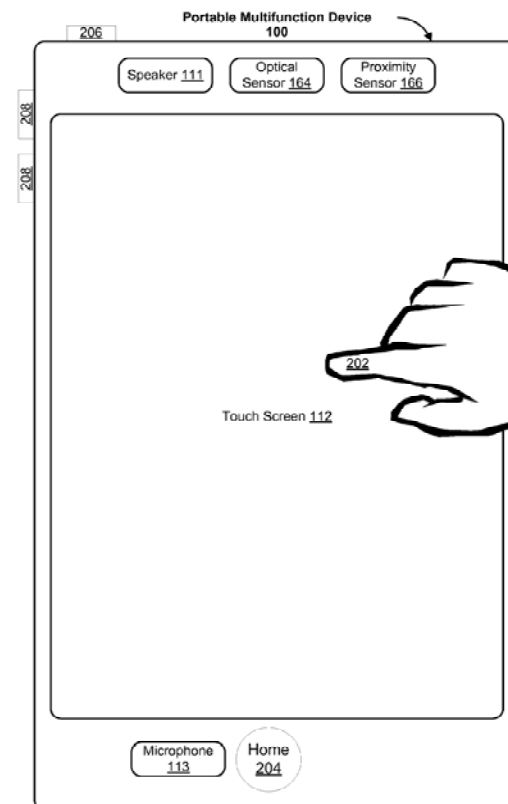


Figure 2

Patents

(12) **United States Patent**
Metaxas et al.

(10) **Patent No.:** **US 8,121,347 B2**
(45) **Date of Patent:** **Feb. 21, 2012**

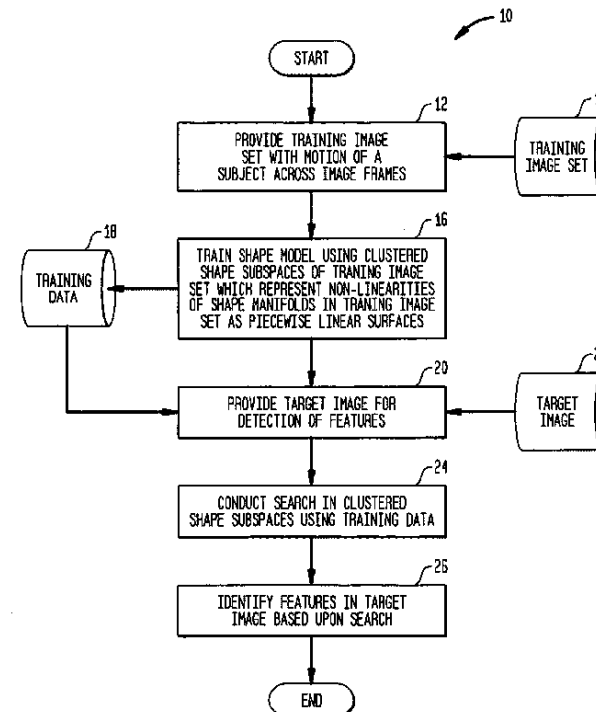
(54) **SYSTEM AND METHOD FOR DETECTING AND TRACKING FEATURES IN IMAGES**

(75) Inventors: **Dimitris Metaxas**, North Brunswick, NJ (US); **Atul Kanaujia**, Piscataway, NJ (US)

(73) Assignee: **Rutgers, The State University of New Jersey**, New Brunswick, NJ (US)

(57) **ABSTRACT**

A system and method for tracking features, e.g., facial features, is provided, which allows for the tracking of features which move in a series of images and whose shape changes nonlinearly due to perspective projection and complex 3D movements. A training set of images is processed to produce clustered shape subspaces corresponding to the set of images, such that non-linear shape manifolds in the images are represented as piecewise, overlapping linear surfaces that are clustered according to similarities in perspectives. A landmark-based training algorithm (e.g., ASM) is applied to the clustered shape subspaces to train a model of the clustered shape subspaces and to create training data. A subsequent image is processed using the training data to identify features in the target image by creating an initial shape, superimposing the initial shape on the target image, and then iteratively deforming the shape in accordance with the model until a final shape is produced corresponding to a feature in the target image.



Patents

(12) **United States Patent**
Metaxas et al.

(10) **Patent No.:** **US 8,121,347 B2**
(45) **Date of Patent:** **Feb. 21, 2012**

FIG. 8A

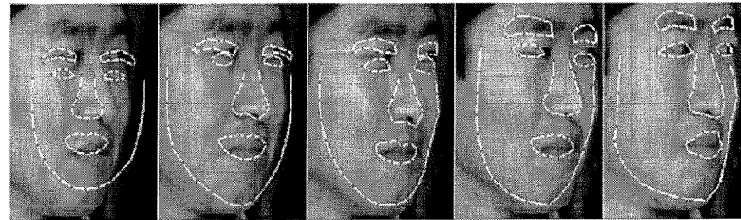
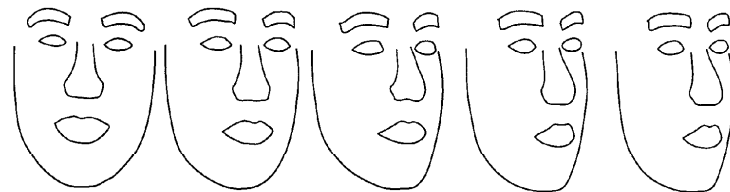


FIG. 8B



Patents

(12) **United States Patent**
Metaxas et al.

(10) **Patent No.:** **US 8,121,347 B2**
(45) **Date of Patent:** **Feb. 21, 2012**

What is claimed is:

1. A method for detecting and tracking a feature in an image, comprising the steps of:
 - obtaining a set of training images clustered into clustered shape subspaces representative of at least one non-linear shape manifold in the training images;
 - receiving an image in which identification of a feature in the image is desired and movement of the feature has occurred with respect to a previous image;
 - creating an initial shape for identifying the feature in the image;
 - searching through the clustered shape subspaces to find a potential matching shape which potentially matches the feature;
 - deforming the initial shape into the potential matching shape; and
 - continuing searching and deformation until a final shape indicative of the feature is obtained.

Patents

◆ Design Patents

- Protect the ornamental appearance of a product
- Term of Protection: 14 years from the issue date

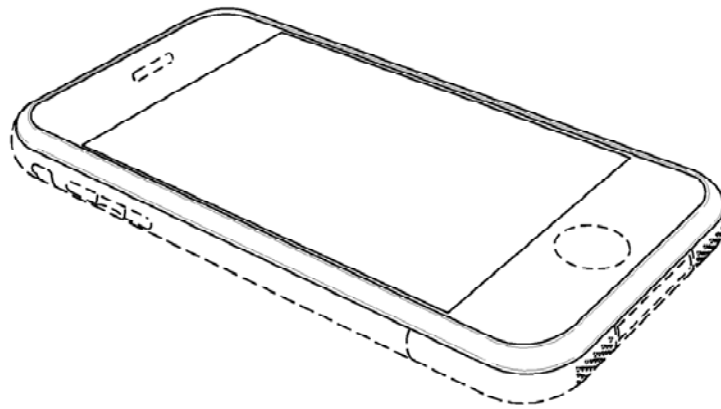


FIG. 9

Patents

- ◆ Provisional Patent Applications
 - Pending for 1 Year
 - Not examined
 - Must be followed up with Non-provisional filing within 1 Year
 - Reduced government filing fee
- ◆ Non-Provisional Patent Applications
 - Includes Claims
 - Examined by U.S. Patent Office Examiner

Patents

- ◆ Foreign Patent Applications
 - Patent Cooperation Treat (PCT)
 - Individual Foreign Filings

Patents

- ◆ What can be patented?
 - Any process, machine, article of manufacture, composition of matter and improvements on any one of these
- ◆ Examples of processes:
 - Method of manufacturing a semiconductor (process control)
 - Method of generating 3-D images from MRI scan (software)
 - Method of displaying bouncing of page when the end of document is reached (user interface)

Patents

◆ Patentability Considerations

– Utility (Section 101)

- Invention must possess some type of utility in order to be patentable.
- Low threshold
 - Identifiable benefit, and capable of use
- Even games can possess sufficient utility...

Patents

(12) **United States Patent**
Olson

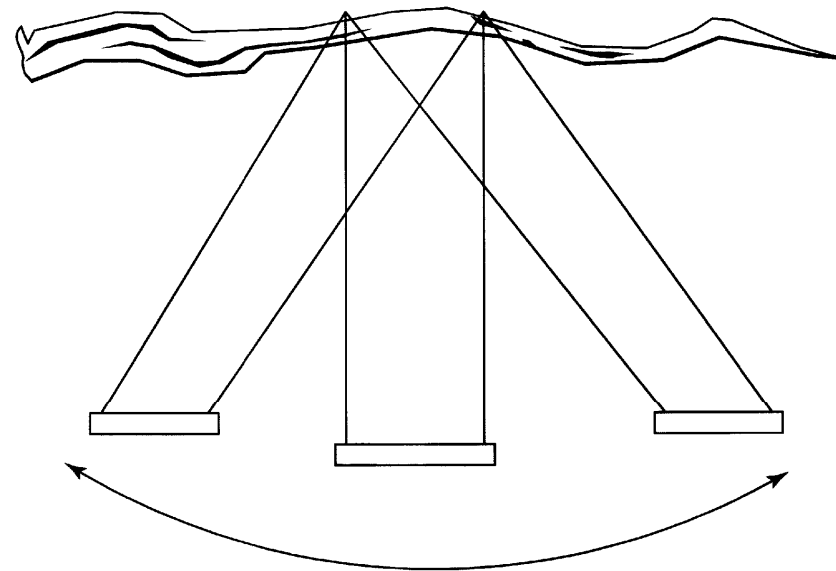
(10) **Patent No.:** **US 6,368,227 B1**
(45) **Date of Patent:** **Apr. 9, 2002**

(54) **METHOD OF SWINGING ON A SWING**

(76) **Inventor:** **Steven Olson**, 337 Otis Ave., St. Paul, MN (US) 55104

(57) **ABSTRACT**

A method of swing on a swing is disclosed, in which a user positioned on a standard swing suspended by two chains from a substantially horizontal tree branch induces side to side motion by pulling alternately on one chain and then the other.



Patents

- ◆ Concerns regarding Statutory Subject Matter (Section 101)
 - The State Street Bank Case
 - The Bilski Case
 - Current Law: Abstract Ideas are Unpatentable
- ◆ Increased importance of disclosing computer hardware in software patent applications

Patents

◆ Patentability Considerations

– Novelty (Section 102)

- No single prior art reference discloses each feature of the invention to be patented

– Non-Obviousness (Section 103)

- “A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.”

Patents

◆ Patentability Considerations

– Non-Obviousness (Section 103)

- Often a gray area
- Often the subject of argument in the Patent Office
- No single test for obviousness, but useful considerations are:
 - Teachings of the prior art
 - Level of ordinary skill in the art
 - Teaching/suggestion/motivation to combine art
 - Teaching away from combination
 - Unpredictable results
 - Simple substitution of known elements to obtain predictable results
 - Others...

Patents

- ◆ Typical Patent Application includes:
 - Title
 - Background of Invention
 - Summary of Invention
 - Brief Description of Drawings
 - Detailed Description of Invention
 - Claims
 - Drawings

Patents

◆ Content Requirement

- Enablement: The inventor is required to set forth in the specification sufficient information to enable a person skilled in the relevant art to make and use the claimed invention without “undue experimentation.”
- Best Mode: The specification must set forth the best mode contemplated by the inventor for carrying out the invention.
 - Purpose is to prevent inventors from obtaining patent protection while concealing from the public preferred embodiments of their invention.

Patents

- ◆ Preparation and Filing of Application
- ◆ “Prosecution” of Application
 - “Patent Pending” Status after filing of application
 - Declaration and Assignment of Invention
 - Information Disclosure Statement
 - Examination of Application
 - Office Action
 - Notice of Allowance and Payment of Issue Fee

Patents

- ◆ “Prosecution” of Application
 - Telephone Interviews with Examiners
 - Arguments in support of claims
 - Explore potential claim amendments
 - Personal Interviews
 - Same as above, but conducted at USPTO
 - Often useful to bring sample of invention
 - Requests for Continued Examination (RCEs)
 - Appeals

Patents

- ◆ Effect of Publications / Public Disclosures of Invention before filing:
 - BAD if foreign filing is of interest
 - 1 year grace period for publications by authors within one year of U.S. filing date
- ◆ “First Inventor to file” Patent System in the U.S.
 - Encourages filing early to avoid prior art
 - Increased reliance on provisional patent filings

Copyrights

- ◆ Purpose: To protect works of authorship from unauthorized copying
- ◆ Obtaining Copyright Rights
 - Copyrights attach when work is created.
 - Notice: © date of publication, copyright owner.

Copyrights

- ◆ Copyright Registration
 - Allows for Filing Copyright Infringement Action
 - Allows for Statutory Damages
- Consider Filing Copyright Application on Each Major Software Revision
 - Copyright protection can extend to source code, object code, and user interface screens

Copyrights

- ◆ Application
 - Complete appropriate form (TX, VA, etc.)
 - Deposit - copy of work
 - Confidentiality Issue
 - Filing fee
- ◆ Infringement
 - Ownership of Copyright and Copying.
 - Copying proved by showing:
 - Access by Infringer to copyrighted work; and
 - Substantial Similarity between infringing and copyrighted work.

Copyrights

◆ Copyright Ownership

- Initially vests with author(s)
- Can be transferred by express assignment of copyright
- “Works-made-for-hire” doctrine
 - Ownership by employer if work made by employee within the scope of his/her employment – OR --
 - Writing designating work a ‘Work-made-for-hire’ and the work falls under one of the following statutory categories for protection:
 - a work specially ordered or commissioned for use as a contribution to a collective work, as a part of a motion picture or other audiovisual work, as a translation, as a supplementary work, as a compilation, as an instructional text, as a test, as answer material for a test, or as an atlas

Other Forms of IP Protection for Software

- ◆ Trade Secret Protection
 - State Law
 - General principles:
 - Technology that derives independent economic value
 - Subject of reasonable efforts to protect the technology from disclosure
- ◆ Trademark Law
 - Names / Logos / Designs / Sounds / Etc.
 - Purpose: to identify the source of goods/services
 - Standard for infringement: Likelihood of Confusion

Other Forms of IP Protection for Software

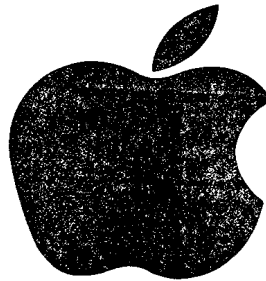
Int. Cl.: 9

Prior U.S. Cl.: 26, 38

United States Patent and Trademark Office

Reg. No. 1,114,431
Registered Mar. 6, 1979

TRADEMARK
Principal Register



Apple Computer, Inc. (California corporation)
10260 Bandley Drive
Cupertino, Calif. 95014

For: COMPUTERS AND COMPUTER PROGRAMS
RECORDED ON PAPER AND TAPE, in CLASS 9
(U.S. CLS. 26 and 38).

First use during January 1977; in commerce January
1977.

The mark consists of a silhouette of an apple with a
bite removed.

Owner of Reg. No. 1,078,312.

Ser. No. 162,799, filed Mar. 20, 1978.

J. TINGLEY, Examiner

Open Source Software

- ◆ Basic principle: Copyright Holder Grants the Rights to Study, Change, and Distribute Software
 - Collaborative software development
- ◆ IP Rights are Determined by the Open Source License
- ◆ Examples of Open Source Licenses:
 - BSD “2-Clause” License
 - GNU General Public License (GPL)
 - Mozilla Public License 2.0

Open Source Software

- ◆ Open source licenses are generally concerned with copyright protection, not patent protection
- ◆ “Copyleft” Doctrine
 - Opposite of Copyright – Grants the right to a Licensee to Distribute Copies of a Work
 - Requires that Any Modified Works also grant the same rights to Licensees
- ◆ Open Source Licenses Treat Copyleft Concept Differently
- ◆ Potential Issues Where Different Open Source Licenses are in conflict, in one software project (particularly with respect to Copyleft doctrine)

Open Source Software

- ◆ BSD “2-Clause” License
- ◆ “Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:
 - 1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
 - 2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.”
- ◆ No “copyleft” clause, therefore “friendliest” to proprietary IP rights.

Open Source Software

◆ GNU General Public License (GPL) (Version 3)

- Strong copyleft clause to prevent redistribution of the software (even if modified) except under the terms of the license

GPL Code (Copyleft)	Proprietary Code (Copyleft?)
---------------------------	------------------------------------

- Linking provides a problem – Does a GPL license apply to a proprietary program as a derivative work if the program uses a GPL library?
 - GNU Lesser General Public License (LGPL) – Confines copyleft to only the code subject to LGPL license.

LGPL Code (Copyleft)	Proprietary Code (Not Copyleft)
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Open Source Software

- ◆ GNU GPL (Version 3) – Updates and changes from Version 2
 - Forbids hardware restrictions placed on software modification
 - Allows users to break Digital Right Management DRM on GPL software without breaking laws (e.g., DMCA)
 - Guards against software patent infringement claims in connection with GPL'ed software

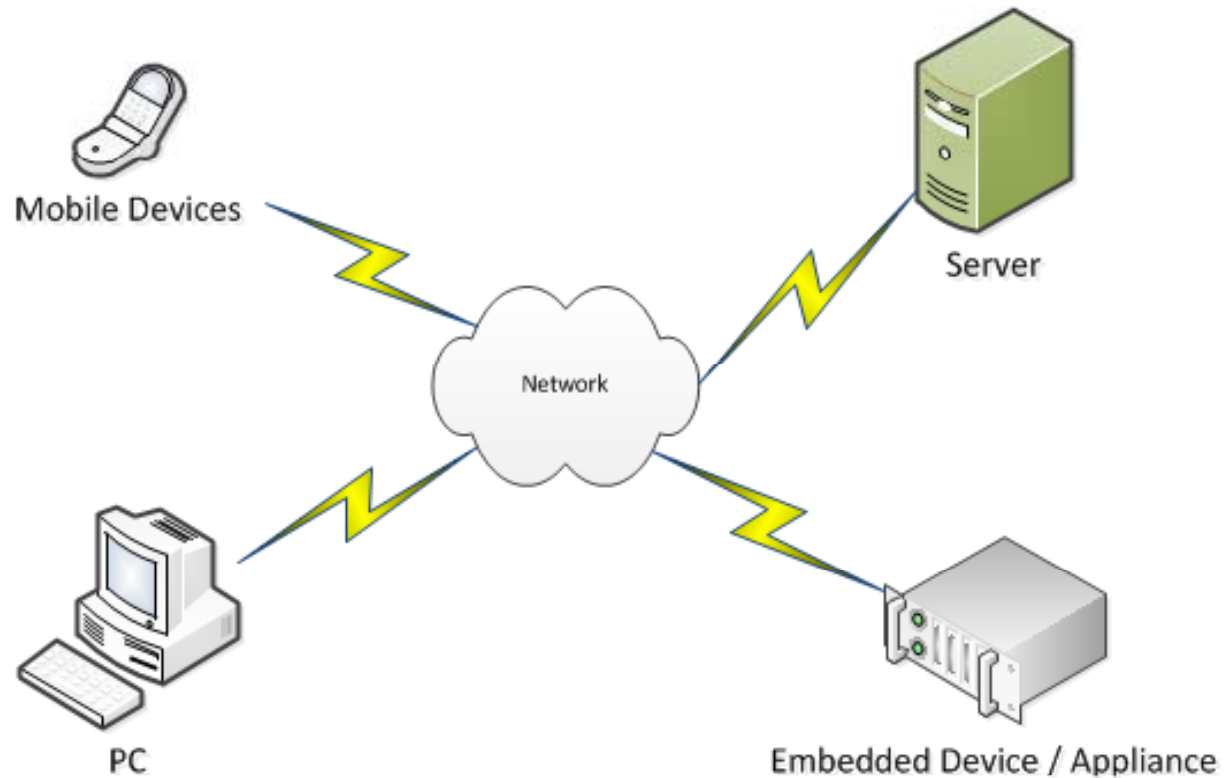
Open Source Software

- ◆ Mozilla Public License (Version 2.0)
 - Weak copyleft clause
 - A middle ground between the BSD license and the GNU General Public License
 - Allows MPL source code (and any modifications thereto) to be mixed with proprietary source code as long as the MPL source code (and any modifications thereto) remain under the MPL license and are freely available in source form
 - Similar to the GNU Lesser General Public License
 - Treats the source code file as the boundary between MPL licensed parts and proprietary parts

Open Source Software

- ◆ Examples of other open-source software licenses:
 - Apache License
 - Apple Public source license
 - MIT License / X11 License
 - PHP License
 - Python Software Foundation License
 - W3C Software Notice and License

Fitting IP Protection Into a Software Protect...



Ownership of Software?

- ◆ Federal law provides some of the answers
- ◆ University IP policy provides some answers (<http://otc.umd.edu/USMPolicies.html>)
- ◆ Contracts provide the remaining answers

Ownership of Software?

- ◆ University owns © and patent rights in software:
 - Created by staff (non-faculty personnel) w/in scope of employment
 - Created by personnel and students under Sponsored Research Agreements
 - Created under another written agreement
 - Created by personnel using resources beyond those usually/customarily provided
 - Created by students using resources beyond (w/o permission) when the software was not created as part of academic/research activities

Ownership of Software?

- ◆ Personnel & students own © and patent rights in software:
 - Where the University does not
 - When created by students as part of academic/research activities

Inventor/Author Responsibilities

- ◆ Keep good records
 - Lab notebooks / logs
 - Emails
- ◆ Disclose timely to OTC where applicable
 - Disclose computer programs and software to OTC when created in whole or in part with federal funding
- ◆ Assist in patent process and update OTC on public disclosures
- ◆ Formalize research/collaboration agreements

Questions

- ◆ Thank you!
- ◆ Q&A Session