

Projects at ORAND

Juan Manuel Barrios

Director of Research
ORAND S.A., Chile
juan.barrios@orand.cl

- Chilean private company: <http://www.orand.cl>
- Research Center in Computer Science + Software Development.
- Links academy and industry (R&D projects):
 - Pull model: Detect a challenging problem in the industry and apply technology from the academy to solve it.
 - Push model: Apply a novel technology developed in the academy to solve some problem in the industry.
 - Applied research in collaboration with the academy in order to improve the state-of-the-art techniques.
 - Produce a final solution to end users and maintain software.

Collaboration

- Collaboration with many chilean and international institutions.



University of Chile



Pontifical Catholic
University of Chile



University of
Santiago



National Laboratory for
High Performance Computing



Federal University of
Minas Gerais



Federal University of
Paraná



University of
Campinas



University of Rouen



Research institute in computer
science and random systems

Areas at ORAND

- Main areas:
 - a) Secure Mobile Transactions.
 - b) OCR and Handwriting recognition.
 - c) Data mining and Text mining.
 - d) TV Analysis and Video Surveillance.



Secure Transactions

■ Safe Signer

- Start and/or confirm each bank transaction (including ATMs and Bank website) with the cellphone.
- Prevent viruses and trojans by using a different channel to validate a transaction.
- <http://www.safesigner.com/>



Banking Checks

■ Safe Check

- ☐ Automatic amount recognition (handwritten text) and OCR.
- ☐ Validation of UV patterns in the physical check.
- ☐ Watermark embedded in the scanned image in order to prevent further image edition.
- ☐ Automatic check payment at ATMs.



Data Mining y Text Mining

■ Text Metric

- Monitoring of mailboxes and social networks.
- Automatic document classification, topic detection and sentimental analysis. Time series analysis.
- Question Answering systems.

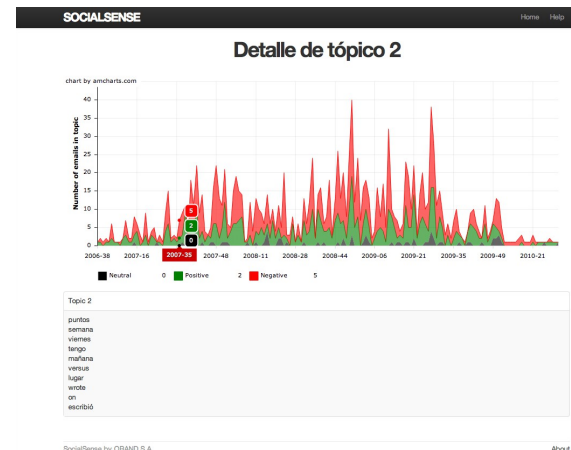
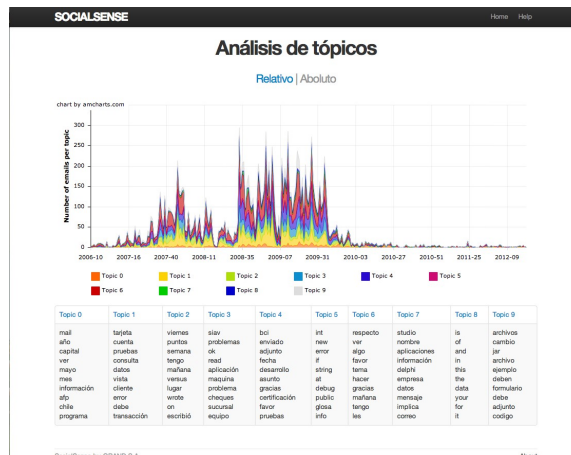
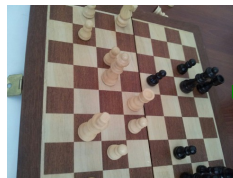
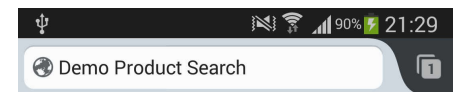


Image Analysis

- Optical object recognition:
 - Identify a product in a catalog given a photo taken by the user.
 - <http://desa.orand.cl/DemoSearch/>



Optical
Recognition



Query (2165):

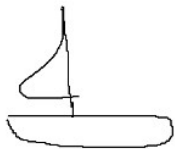
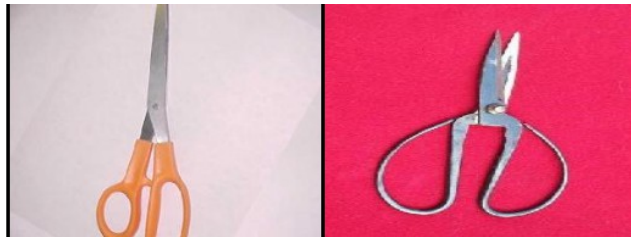
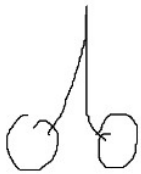
Product	ID	Score
	648707	55
	648677	47
		

Image Analysis

- Sketch-based search:

- Navigate a catalog given a sketch drawn by the user.

- <http://desa.orand.cl/DemoSearch/>



Object	ID
	quitasol
	quitasol

Video Analysis

- Object Localization in TV



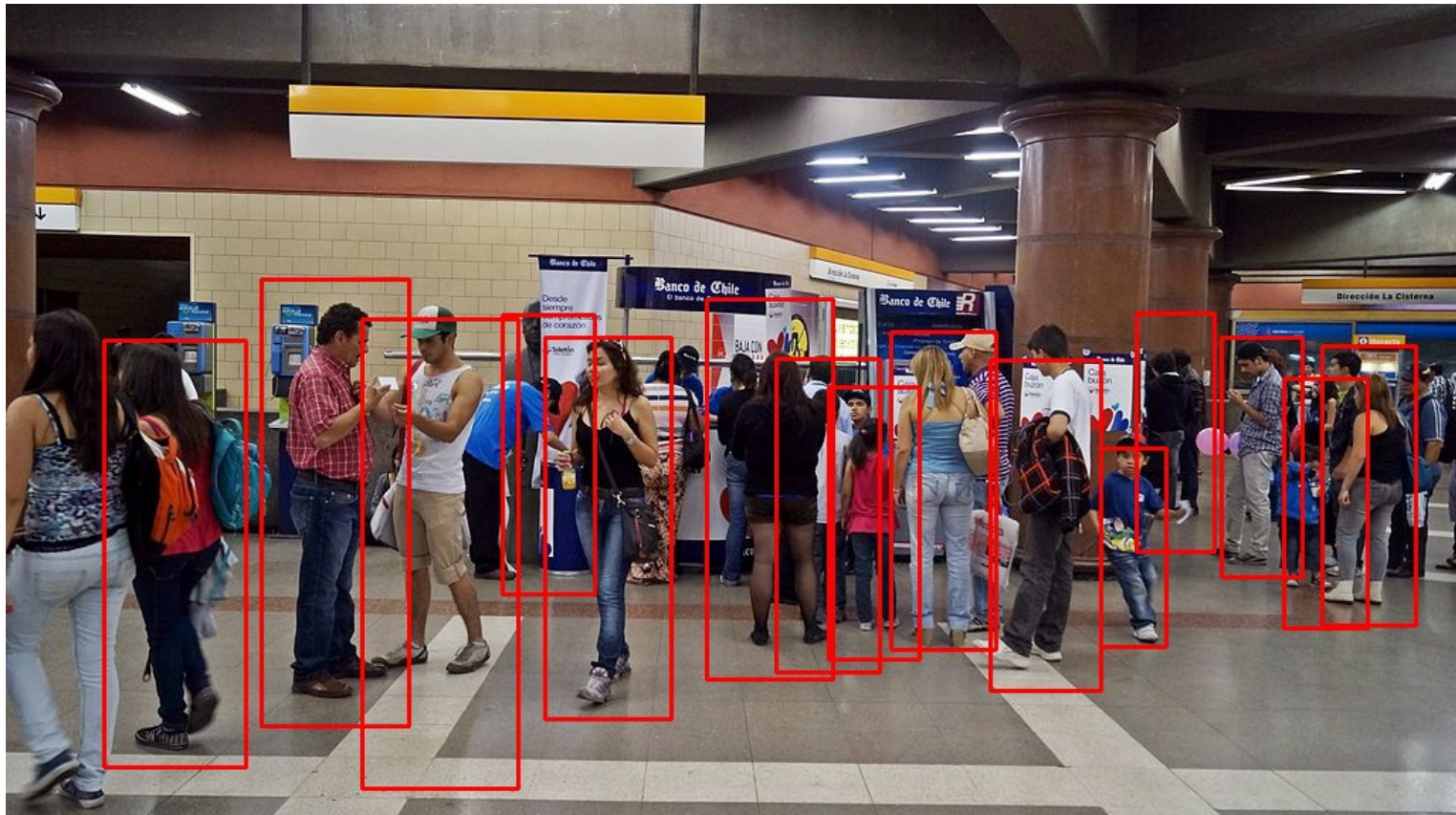
Programme material
(c) BBC

Object examples



Video Surveillance

- People detection.



Video Surveillance

- Object detection and tracking.



Video Surveillance

- Event Detection at TRECVID
 - Locate videos given an event template (name, description and examples).

The screenshot displays the TRECVID Event Detection interface within a Firefox browser window. The address bar shows 'localhost:8080/EventsEval/'. The interface includes a video player on the left showing a street scene with cars. To the right of the video player, there is a section for 'Event: 37' with a 'Replay' button, 'Progress: 4/30', 'Video ID: 228548', and 'Score: 0.739287'. Below this is a 'Next Video' button. Further right is a table of 'Events' with a 'Check All (NO)' checkbox. The table lists various events, with 'Event 37 - Parking a vehicle' highlighted. Below the table is a 'Hide Samples' button. At the bottom, two example images for 'Event 37' are shown: a blue car parked next to a black SUV, and an airplane on a tarmac. A red oval highlights these two example images.

Event	YES	NO
Event 31 - Beekeeping	YES	NO
Event 32 - Wedding shower	YES	NO
Event 33 - Non-motorized vehicle repair	YES	NO
Event 34 - Fixing musical instrument	YES	NO
Event 35 - Horse riding competition	YES	NO
Event 36 - Felling a tree	YES	NO
Event 37 - Parking a vehicle	YES	NO
Event 38 - Playing fetch	YES	NO
One or more people navigate a vehicle into a designated space.	YES	NO
	YES	NO

Event
Template

Conclusions

- Different areas and problems:
 - Secure transactions
 - Mobile app, encryption, transactions
 - Banking checks
 - Handwriting recognition, UV patterns, watermarking.
 - Text Mining
 - Text classification, topic detection, sentimental analysis.
 - Video Surveillance
 - People detection, object tracking, event detection.
- Different industries, including banking, retail, TV.
- Different institutions in collaboration.