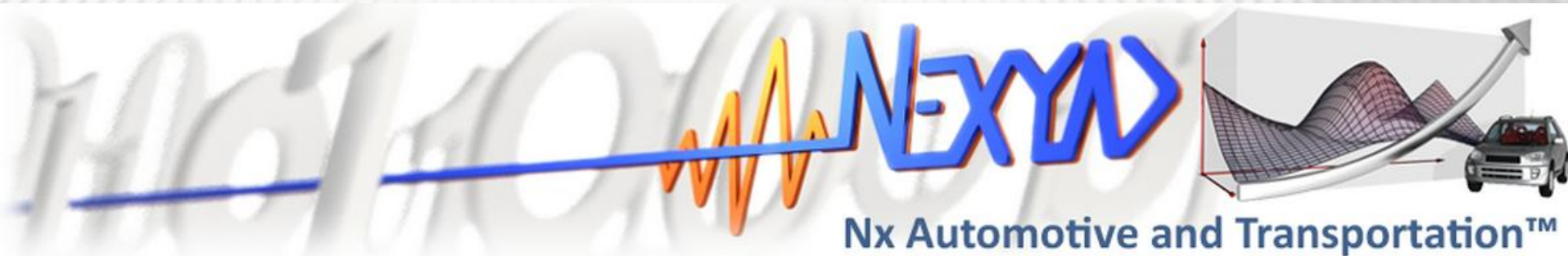WELCOME TO THIS PRESENTATION

Nx Automotive and Transportation™

Enhancing efficiency of your industrial lab and onboard signal/image processing applications

ÜBER NEXYAD

NEXYAD ist ein High-Tech-Unternehmen, das 1995 von den zwei Ingenieuren **Pierre DA SILVA DIAS** und **Gérard YAHIAOUI** gegründet wurde und innovative und erprobte Methoden zur digitalen Daten-, Signal- und Bildbearbeitung entwickelt hat.

Die Kompetenzen des Unternehmens erstrecken sich über vier große, anspruchsvolle Bereiche:

- Automobile und Transport : NEXYAD Automotive & Transportation
- Prüf- und Testsysteme und Qualitätskontrolle: NEXYAD Testing
- Banken/Versicherungen, Marketing und Wirtschaft: NEXYAD Analytics
- Kinoindustrie: NEXYAD Visual Effects

Das französische Unternehmen **NEXYAD** ist Mitglied der Wettbewerbscluster Mov'eo (**Gérard YAHIAOUI** ist stellvertretender Vorsitzender und Vorstandsmitglied von Mov'eo) und Pôle Pôle Media.

ABOUT NEXYAD

NEXYAD is a high-tech company founded by two engineers **Pierre DA SILVA DIAS** and **Gerard YAHIAOUI** in 1995, which has developed innovative and proven methods for the processing of digital data, signals, and images.

The firm's expertise is applied in four major demanding areas :

– Automotive and Transportation: NEXYAD Automotive & Transportation
– testing systems and quality control : NEXYAD Testing
– Banking / Insurance, Marketing and Economics: NEXYAD Analytics
– Movie Industry: NEXYAD Visual Effects

NEXYAD is member of French competitive clusters including Mov'eo (**Gérard YAHIAOUI** is Vice President, Member of the Board of Mov'eo), and Pôle Media.

Focus on NEXYAD Automotive & Transportation

http://www.nexyad.com/Automotive-Transportation

NEXYAD is located in the west Paris suburb (near PSA Peugeot Citroën, RENAULT, VALEO, CONTINENTAL, MAGNA, ...) :

R&D team of 10 persons develop their own products and also work as an external research team for European Industrials

Set up in 1995

http://www.nexyad.com/Automotive-Transportation

- **Gerard YAHIAOUI** is Professor (Engineer – Master II level) : Machine Learning (Artificial Neural Networks, Fuzzy Logic, Genetic Algorithms), expert for ARN (French Ministry for Research), Member of the Board and Vice President of the Competitive French cluster for Automotive and Transportation collaborative research Mov'eo, Member of the Board of the Automotive Research Society VedeCom, author of scientific papers on neural nets - image processing - and data analysis, author of the book « *Techniques Avancées pour le Traitement de l'Information : réseaux de neurones, logique floue, et algorithmes génétiques* » (éditions Cépadès).

- **Pierre DA SILVA DIAS** was Professor (Engineer – Master II) : Computer Science

- **NEXYAD** is involved in French collaborative research programs :

      . Membre of Mov'eo

      . Member of VedeCom

Collaborative Research programs since 2k :

. 2001 – 2004, French PREDIT Research Program : project ARCOS, subjects ; onboard adherence estimation using driving signals and a dynamic model of the car.

. 2001 – 2004, French PREDIT Research Program : project ARCOS, subjects ; road and obstacles detection using a camera

. 2001 – 2004, French PREDIT Research Program : project ARCOS, subjects ; onboard visibility measurement using a camera

. 2005 – 2008, , French PREDIT Research Program : project SARI, subjects ; onboard adherence estimation using driving signals and a dynamic model of the car

. 2005 – 2008, French PREDIT Research Program : project SARI, subjects ; onboard visibility measurement using a camera

. 2005 – 2008, French PREDIT Research Program : project SARI, subjects ; onboard car safety/risk estimation

. 2009 – 2011, French FUI Reasearch project MERIT : autonomous vehicle (runned for the DARPA Challenge)

. 2010 – 2012, French FUI Reasearch project SURVIE : visibility measurement

. 2012 – 2014, French FUI Reasearch project RASSUR : new ADAS (intelligent ACC) involving a radar and camera(based detection (of the road, of obstacles, …) and measurement (visibility measurement) algorithms, and a car safety/risk estimation algorithm.

NEXYAD is member of high tech SMEs clusters that gather to provide
extended functions to their customers :
- Hight Tech SMEs cluster INI (integration of digital technologies for industries)
- High Tech SMEs cluster ITS Infra (Intelligent Transportation Systems for roads and
  infrastructures)
- High Tech SMEs cluster ADAS (Advanced Driver Assistance Systems)
- High Tech SMEs cluster SEMI (Testing systems for Automotive and Aeronautics).

Customers in Automotive and Transportation industries :

|	
AXIMUM (France)	Robert BOSCH GmbH (Germany)
IEE (Luxembourg)	SAINT GOBAIN (France)
FAURECIA (France)	TOYOTA (Belgium)
PSA Peugeot Citroën (France)	VALEO (France)
RENAULT (France)	

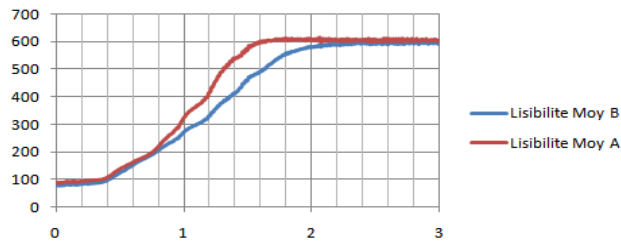PRODUCTS FOR YOUR TESTING NEEDS

VisiNex (and DropNex + RainNex)

Visibility measurement (correlation with human vision = 100%)
- Testing efficiency of **wipers**, windshield **washer**, **demist**, **defrost**, **lighting**,
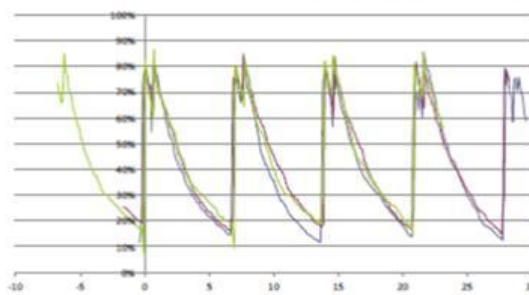**Rain Sensor**, …

Customers : AXIMUM, **PSA** Peugeot Citroën, Robert **BOSCH** GmbH, **SAINT GOBAIN**, TOYOTA, VALEO,
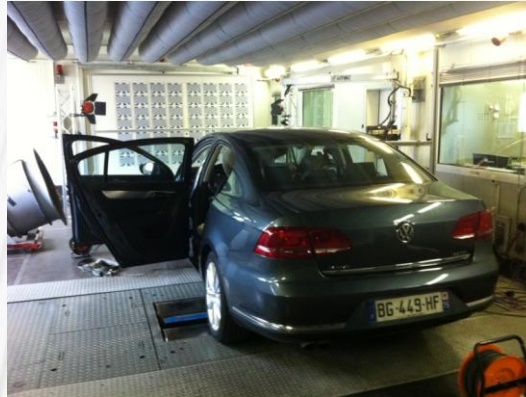
Comparison of two demist systems

- Lisibilite Moy B
- Lisibilite Moy A
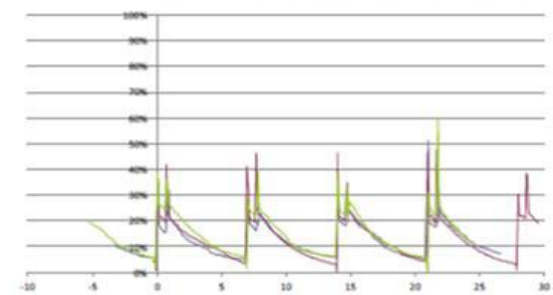
C4, pluie 2, essuyage intermittent, balais neufs

C4, pluie 2, essuyage intermittent, balais usés

Comparison of two qualities of rubber blades

Link to VisiNex product page : http://nexyad.net/Automotive-Transportation/?page_id=159
Link to RainNex product page (a rain machine that works with VisiNex if you don't have your own rain machine) :
http://nexyad.net/Automotive-Transportation/?page_id=151

PRODUCTS FOR YOUR ONBOARD NEEDS

RoadNex

RoadNex is a functional bloc (software) for ADAS : detection of the road shape/contours and lane in front of the vehicle (*click the picture*)

Main interesting points :

-**Self Calibrated** (and calibration is reshaped on a regular basis while driving) : no need to know exact location of the camera (6 parameters that change during accelerations of the car ...) and lens data.

-- shapes of the lane + lane

-- **robust** : shapes are detected most of the time even with no white line of with exhausted road signs.

-- **self diagnosis** : the function tells when it fails

Available for sales :

User Licence for research and demo cars : as a DLL for windows, as a component for the Real Time software RT-MAPS

Embedded User Licence for mass market (as a bloc of YOUR ADAS system on YOUR hardware) : on demand

SafetyNex

SafetyNex is a functional bloc for d'ADAS (software) : safety measurement, taking into account : map and GPS geolocation , speed, accelerations, visibility, adherence, distance to obstacle
SafetyNex can be used to pilot a ACC (a step in direction of autonomous vehicle)

(*click the picture*)

Main interesting points :
-Variable number of inputs : some data may be available or not depending on the instant or on the kind of vehicle : SafetyNex gives the best risk estimation with the available inputs.

Available for sales :
User Licence for research and demo cars : as a DLL for windows, as a component for the Real Time software RT-MAPS
Embedded User Licence for mass market (as a bloc of YOUR ADAS system on YOUR hardware) : on demand

VisiNex Onboard

VisiNex Onboard estimates the visibility on a region of interest (visual quality score and distance of detection).

(*click the picture*)

Main interesting points :
-100% correlated with Human vision performance

Available for sales :
User Licence for research and demo cars : as a DLL for windows, as a component for the Real Time software RT-MAPS
Embedded User Licence for mass market (as a bloc of YOUR ADAS system on YOUR hardware) : on demand

NB : can work with a camera in a car (as soon as every image is segmented with a region of interest : example : in front of the car, ...)

DrowsiNex

DrowsiNex watches the driver and detects the eyes : if eyes disappear or are closed during too much time, then DrowsiNex generates an alarm.
 (*click the picture*)

Main interesting points :
-Self Calibrated : Size of the eyes is self calibrated .

Available for sales :
User Licence for research and demo cars : as a DLL for windows, as a component for the Real Time software RT-MAPS
Embedded User Licence for mass market (as a bloc of YOUR ADAS system on YOUR hardware) : on demand
Smart Phone App : under development

ObstaNex

ObstaNex detects obstacles (a car, a pedestrian). Definition of an obstacle : object that is not plane (or that is « enough » vertical), and/or that has a movement that is not due to the movement of the camera.

(click the picture)

Main interesting points :
-Only ONE camera
- Robust

Available for sales :
User Licence for research and demo cars : as a DLL for windows, as a component for the Real Time software RT-MAPS
Embedded User Licence for mass market (as a bloc of YOUR ADAS system on YOUR hardware) : on demand

PROJECTS

On demand special projects for car industry : examples

- intelligent triggering for airbags / recognition of passengers on seats
- driving style recognition
- driver's attention monitoring
- automatic comparison between vehicle signals and 3D dynamic onboard model outputs
- obstacle detection using rear camera
- obstacle detection using rear capacitive / ultrasound sensors
- autonomous vehicle (DARPA Challenge 2009)
- design plans of validation for ADAS systems on open road

How to test NEXYAD modules ?

- on a PC with your images data base (DLL)

- on a PC using the real time simulation environment RT Maps (by the SME Intermpora)

- see a demo car (for instance, RoadNex is used by an autonomous demo car in University of Valenciennes. For this demo car, real time management is provided by Intempora member of the High tech SMEs cluster ADAS, and system integration (actuators ...) into the car + engine control is provided by FH Electronics member of the High Tech SMEs cluster ADAS).)

- other ? Feel free to propose

Thank you for your time
Questions / Answers

sales@nexyad.net