



Ergonomía y las TICs

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Msc. Ingeniería Biomédica

Especialista en Ergonomía

Odontólogo - Diseñador industrial

Auditor Interno en seguridad industrial y salud ocupacional.



La tecnología rediseña
nuestra manera de vivir

La ergonomía y las tics



1. Contenido

Las TICs: generalidades

Los dispositivos móviles

Los entornos virtuales e inmersivos

La ergonomía y



Avance tecnológico sin precedentes

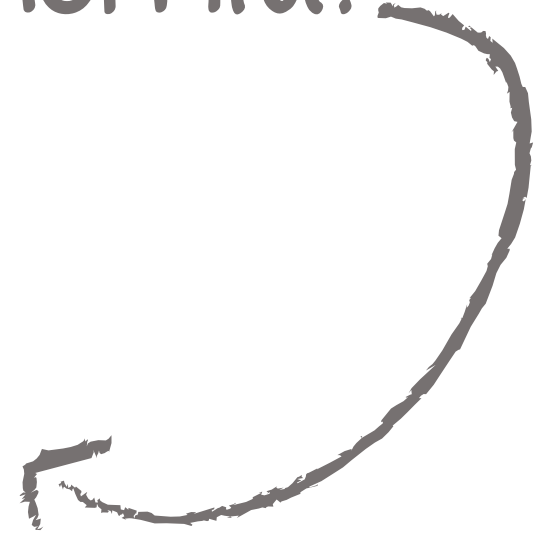
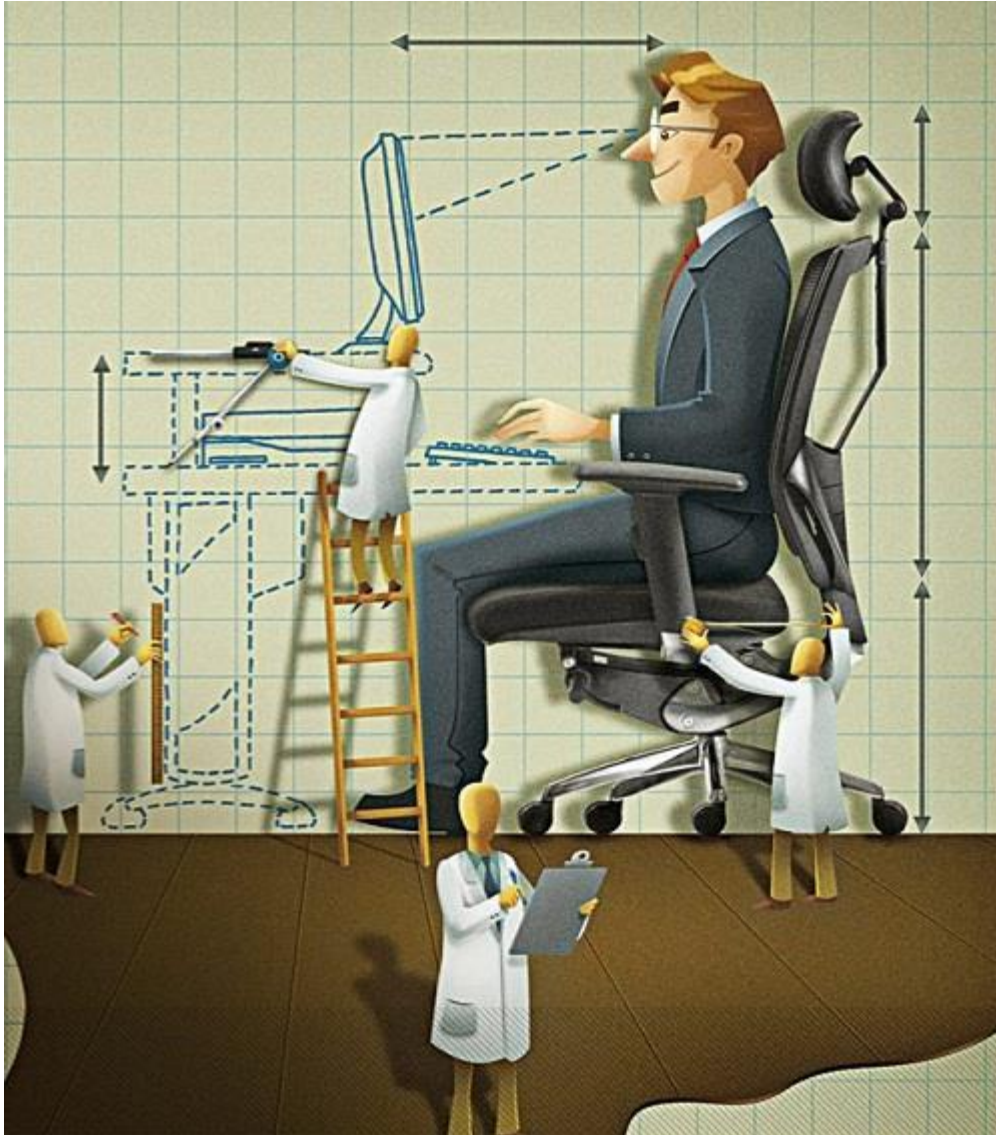
Revolución TIC



TIC: Tecnología de la Información y la Comunicación.



¿Y en ergonomía?



Competencia
Digital ?



Renovación

Conocimiento

Moda

Miedo

Competencias

Valores

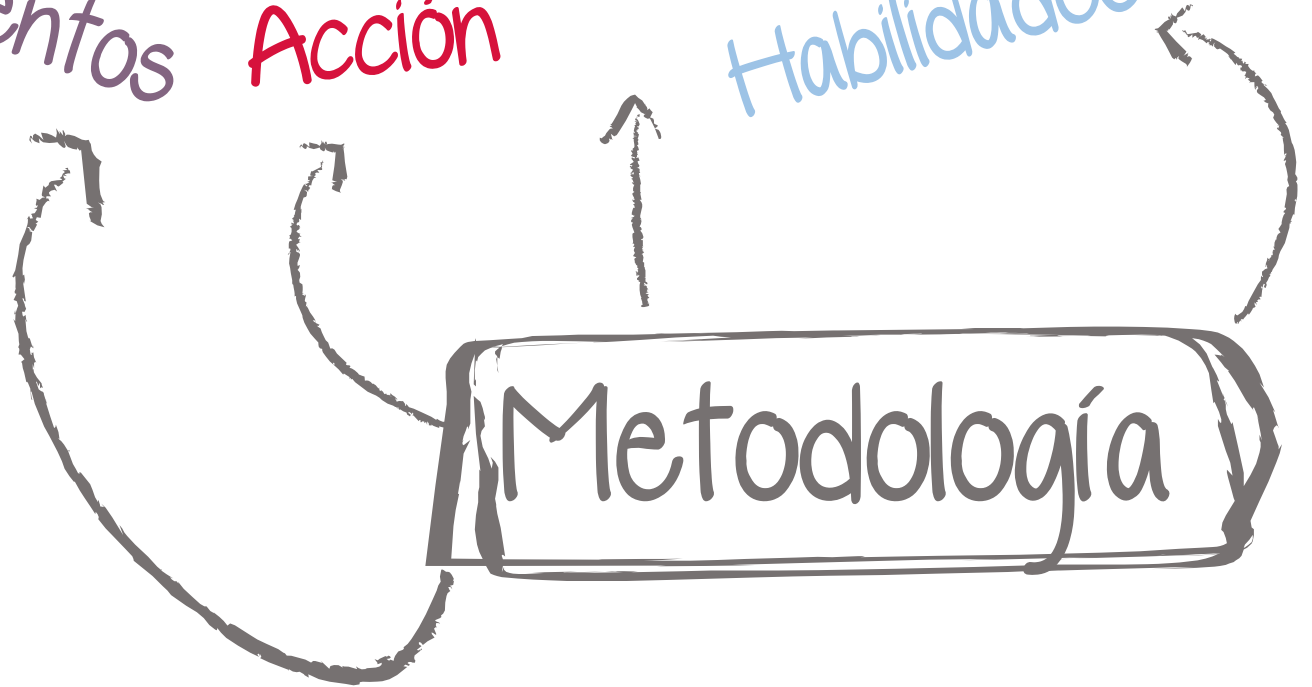
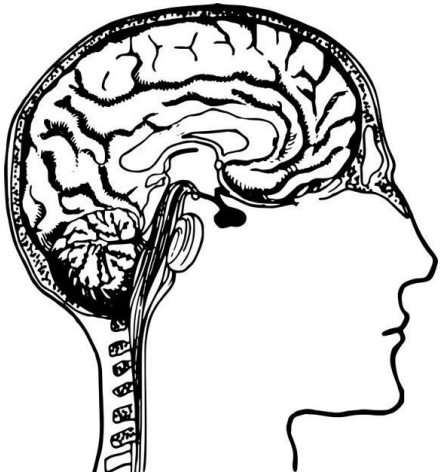
Actitud

Problema

Requerimientos

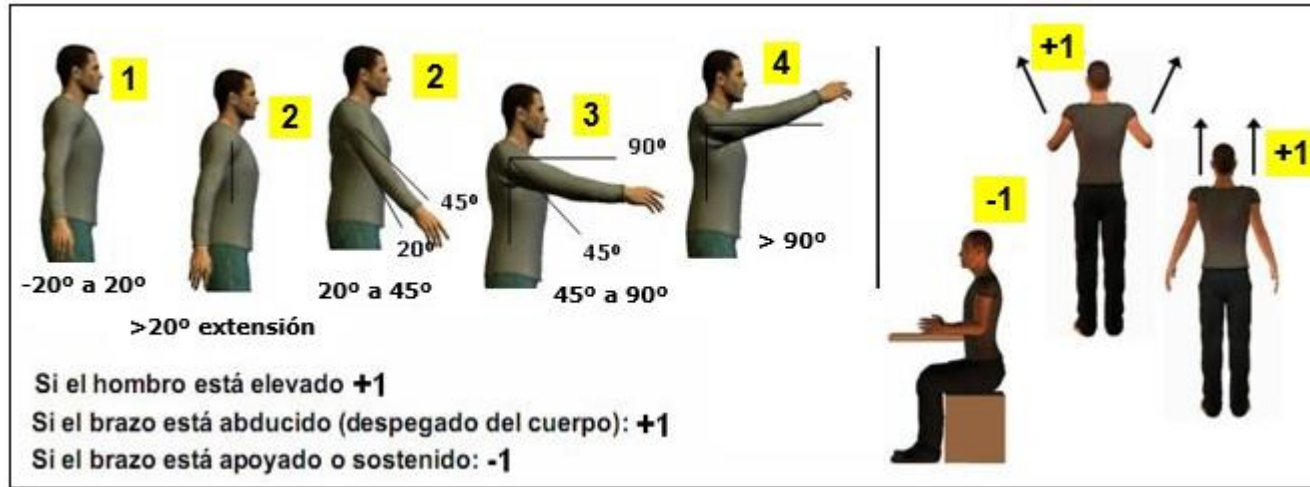
Acción

Habilidades



Metodología

Metodologías



Sensibilidad?

Especificidad?

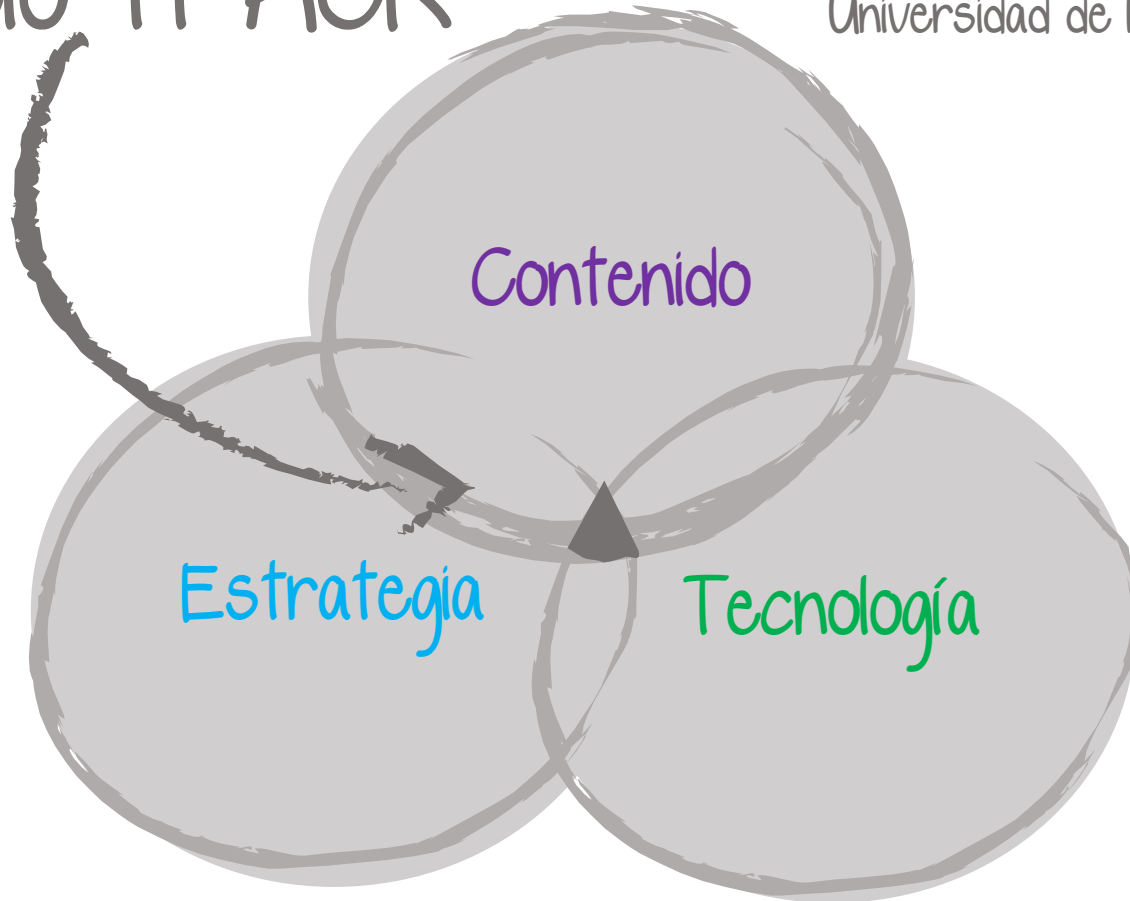
Subjetividad?

Competencia Digital ?

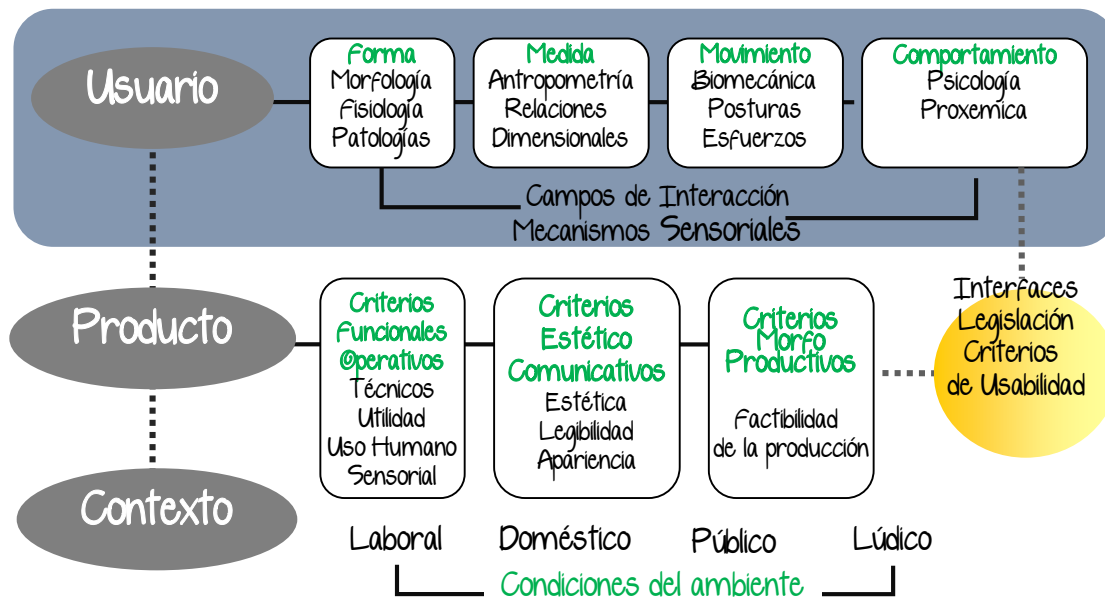


Modelo TPACK

Koehler & Mishra
Universidad de Michigan



Concepción Metodológica



FUENTE: Notas Mg Luz Mercedes Sáenz

Las TIC



Ideas prácticas



Decida la metodología, diseña la secuencia y estructura las actividades

Selecciona las herramientas TIC y los recursos más adecuados.

Desarrolla tu competencia digital.

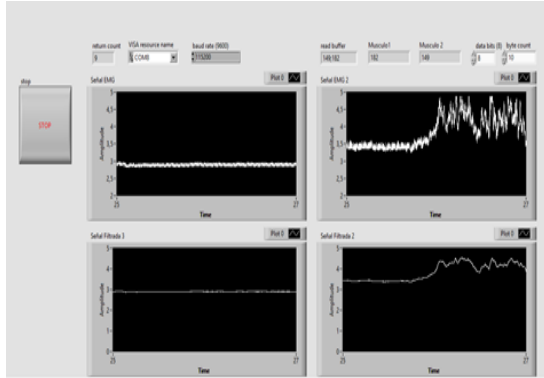
Las TIC



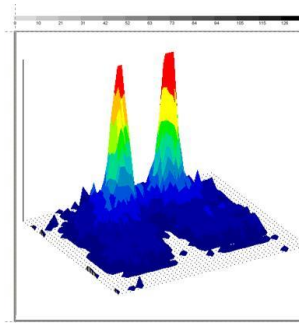
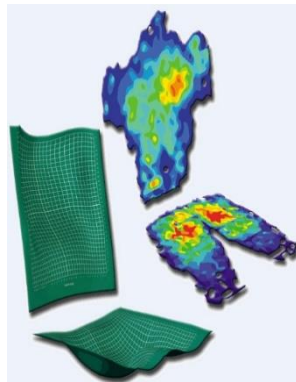
Dispositivos
móviles



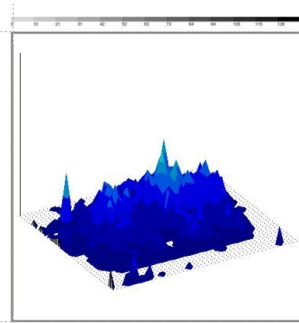
Las TIC



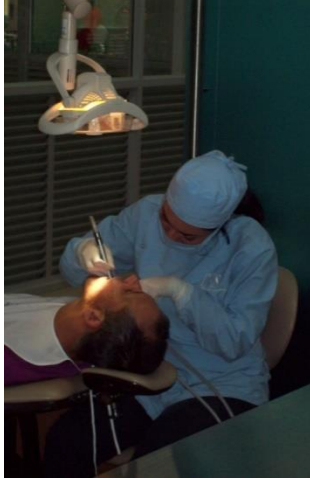
Equipos biomédicos



SUJETO 36. SILLA TRADICIONAL



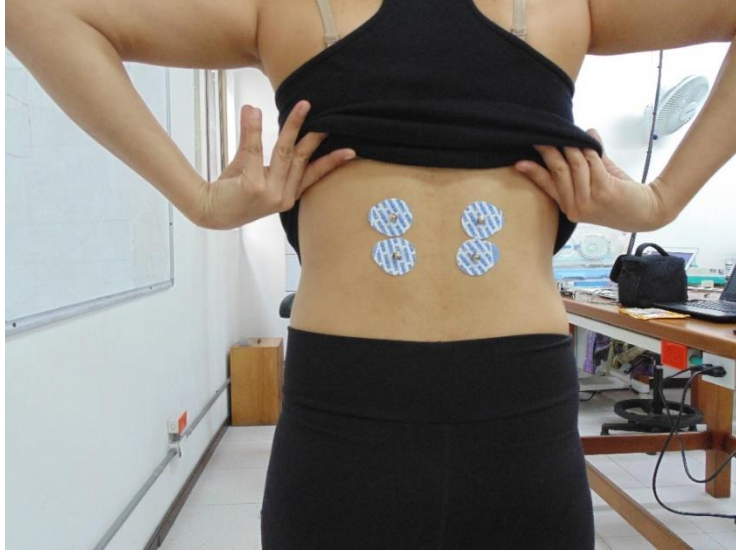
SUJETO 36. SILLA MERCURIO





Aplicación del Instrumento de Branson para evaluación Postural



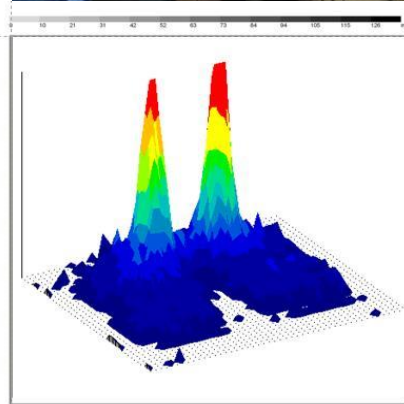
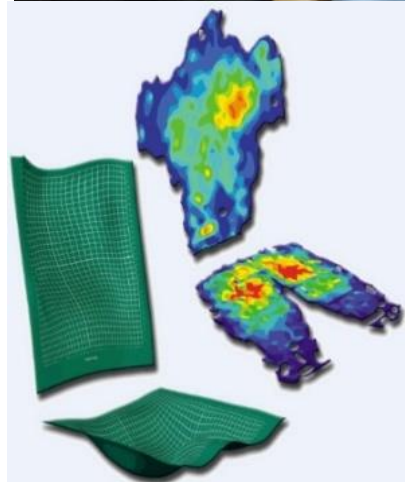
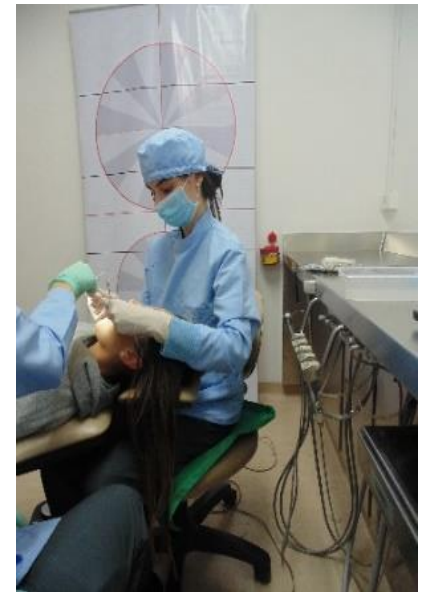




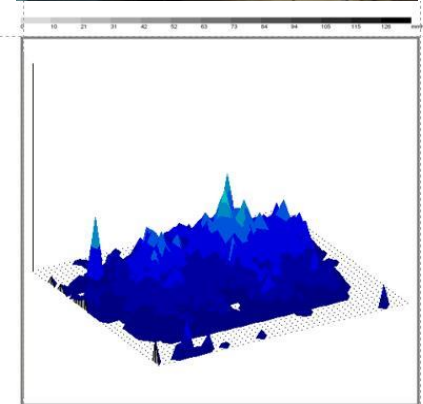




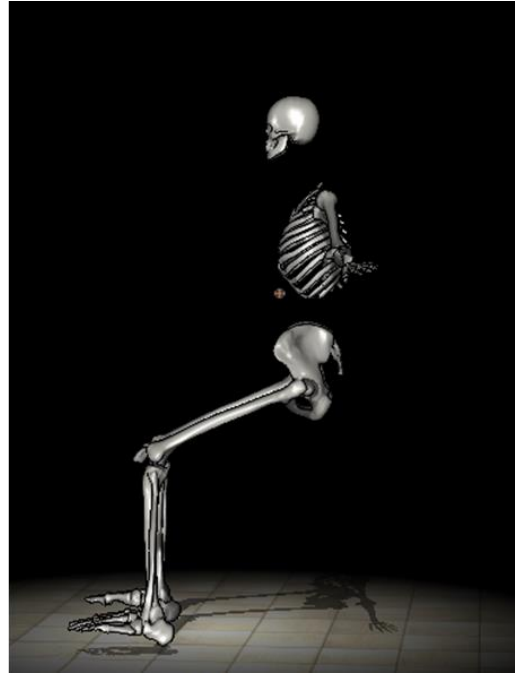
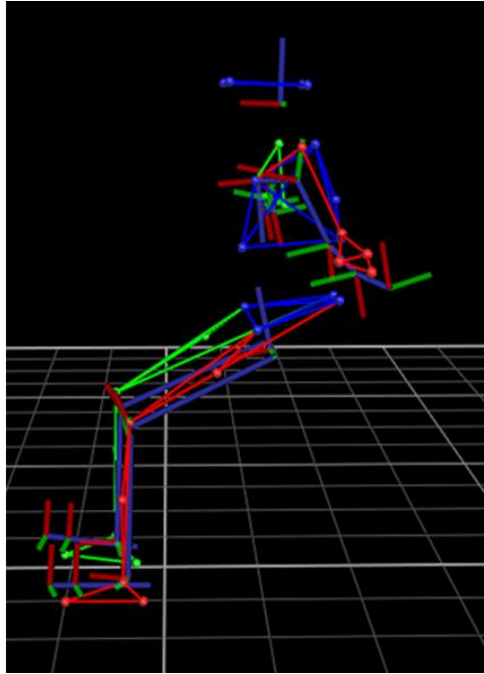


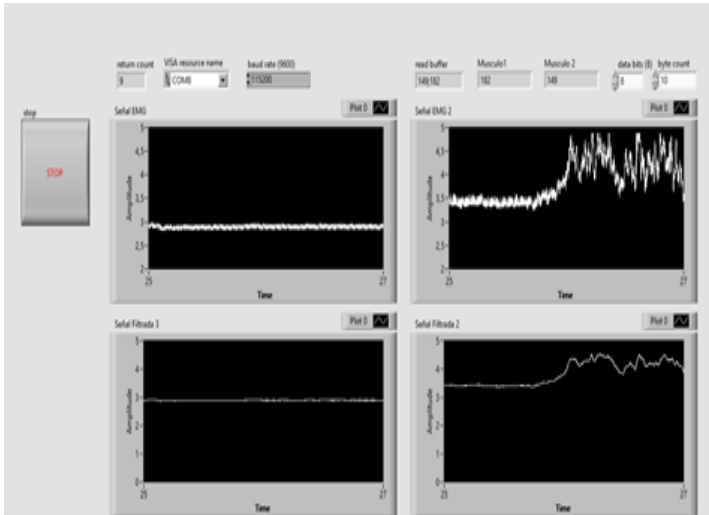
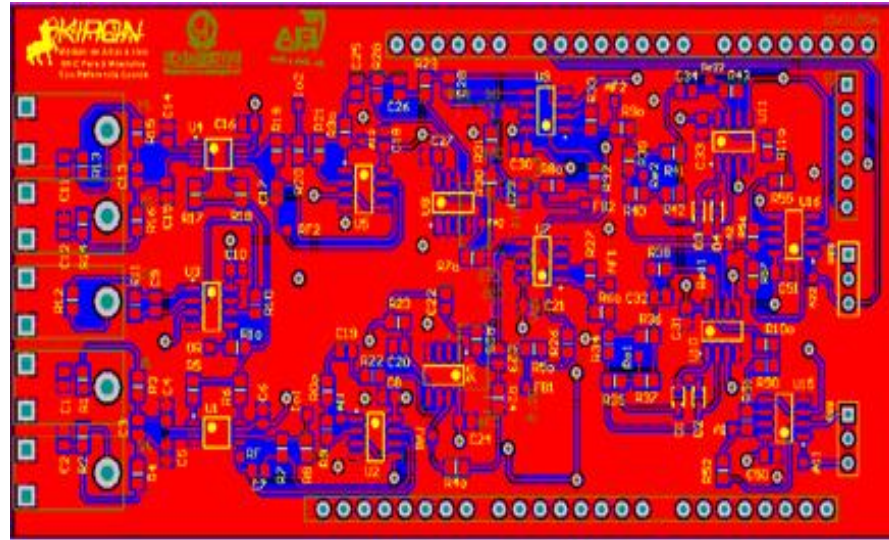


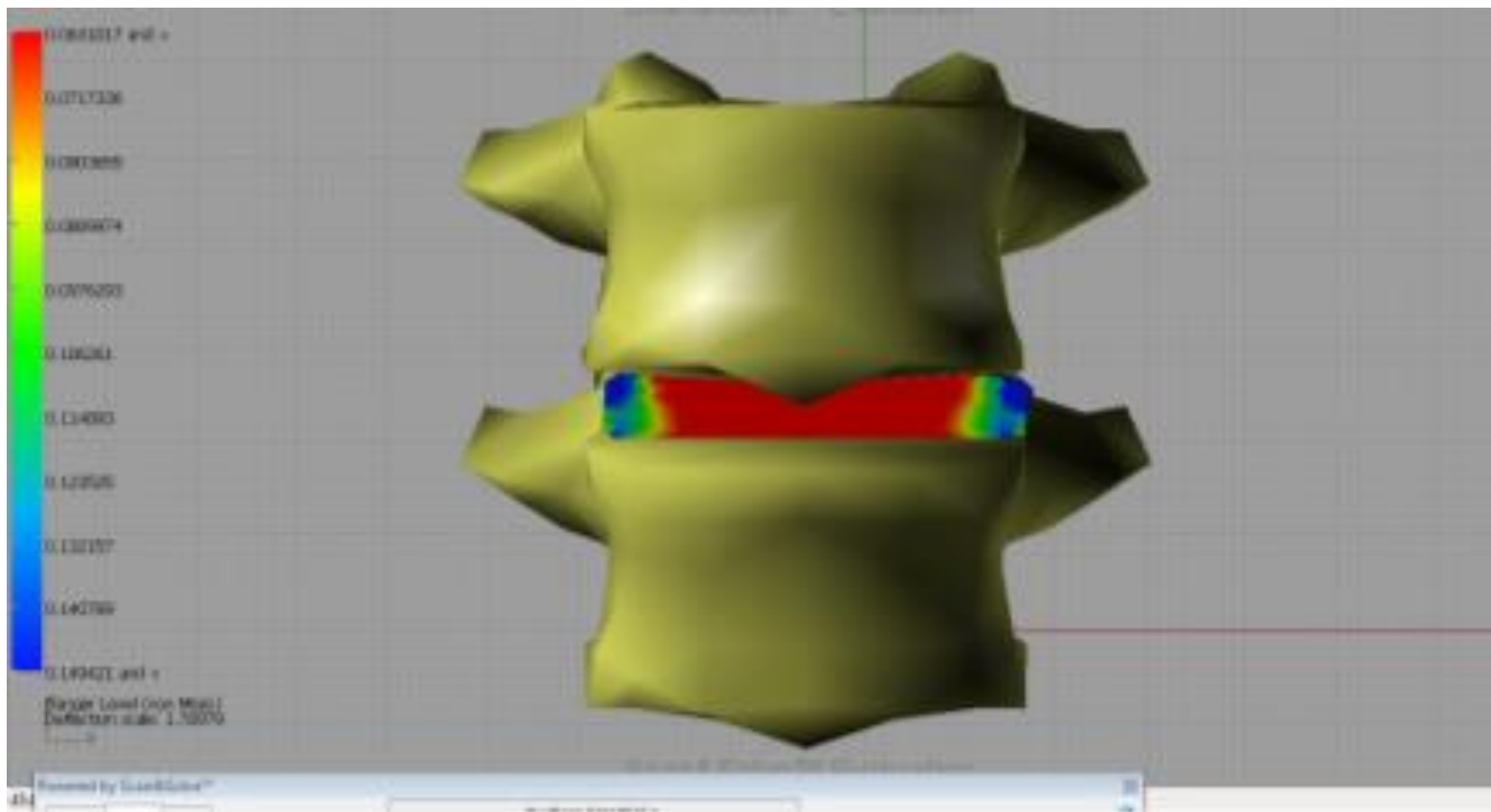
SUJETO 36. SILLA TRADICIONAL



SUJETO 36. SILLA MERCURIO







Las TIC

Dispositivos vestibles



Las TIC



Entornos
virtuales 3D

Manufacturing Operations in Virtual Environments (MOVE)

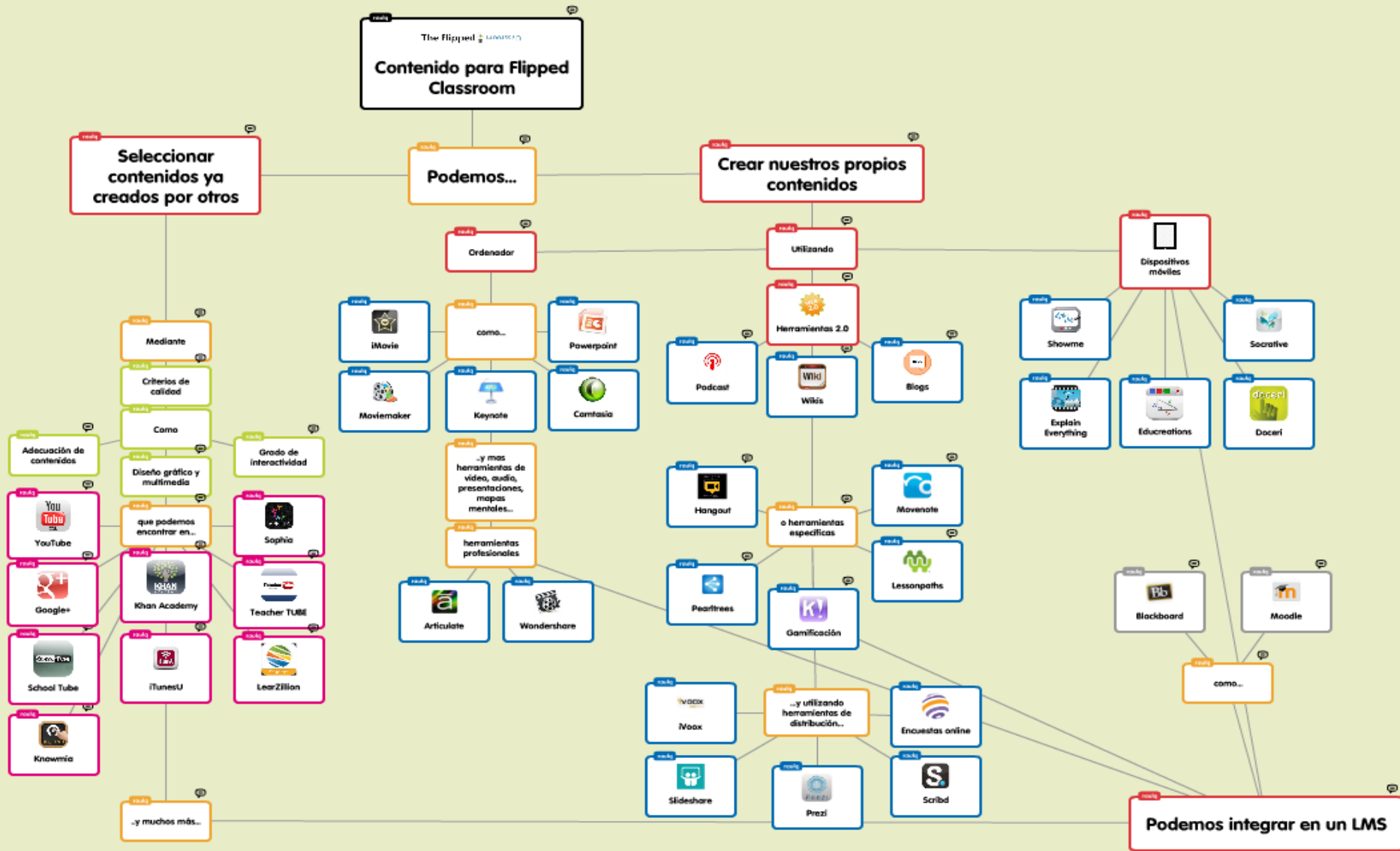
ADVERTENCIA



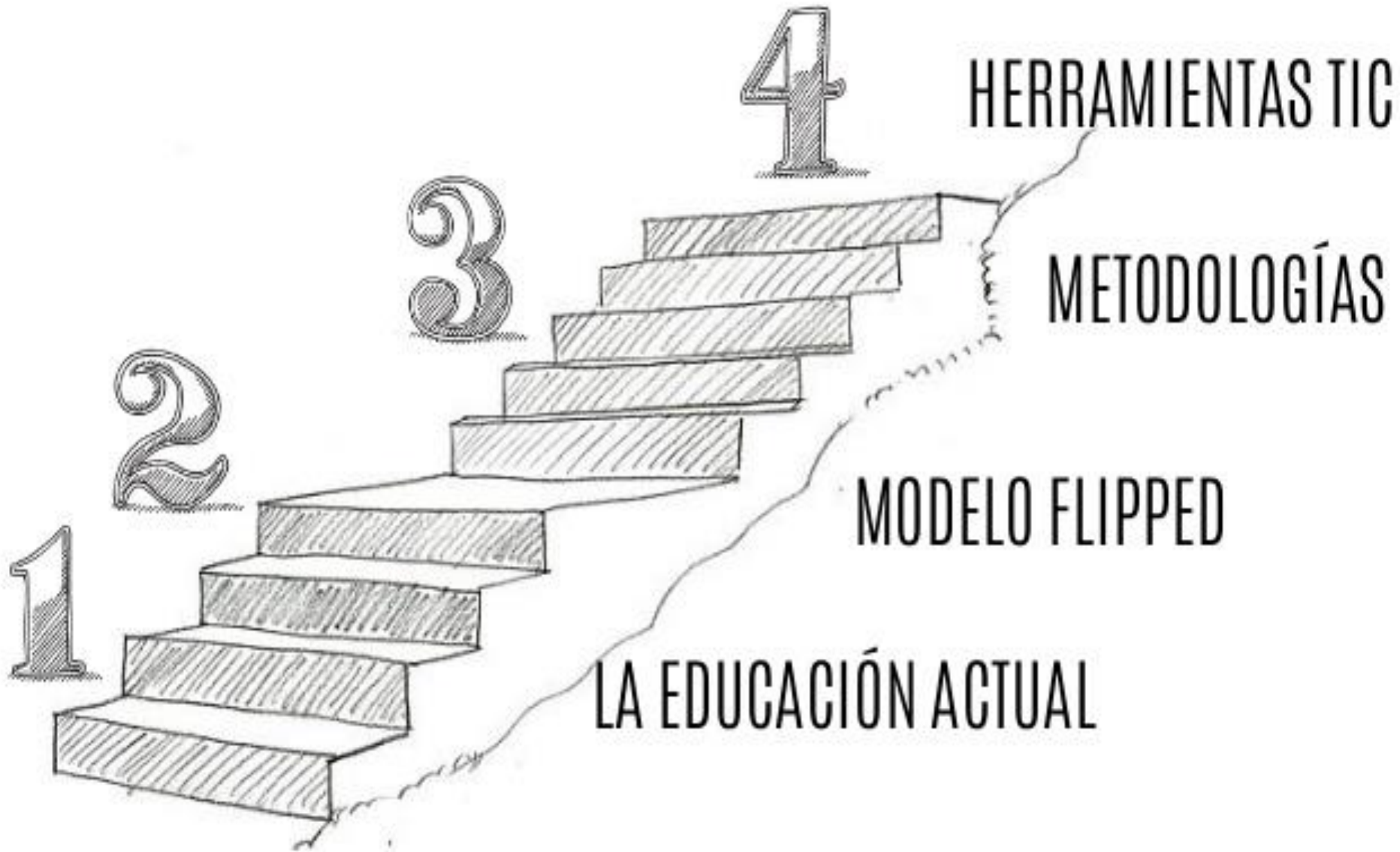
ADVERTENCIA



Las TIC Herramientas Pedagógicas



Las TIC Herramientas Pedagógicas



Las TIC Herramientas Pedagógicas



Las TIC

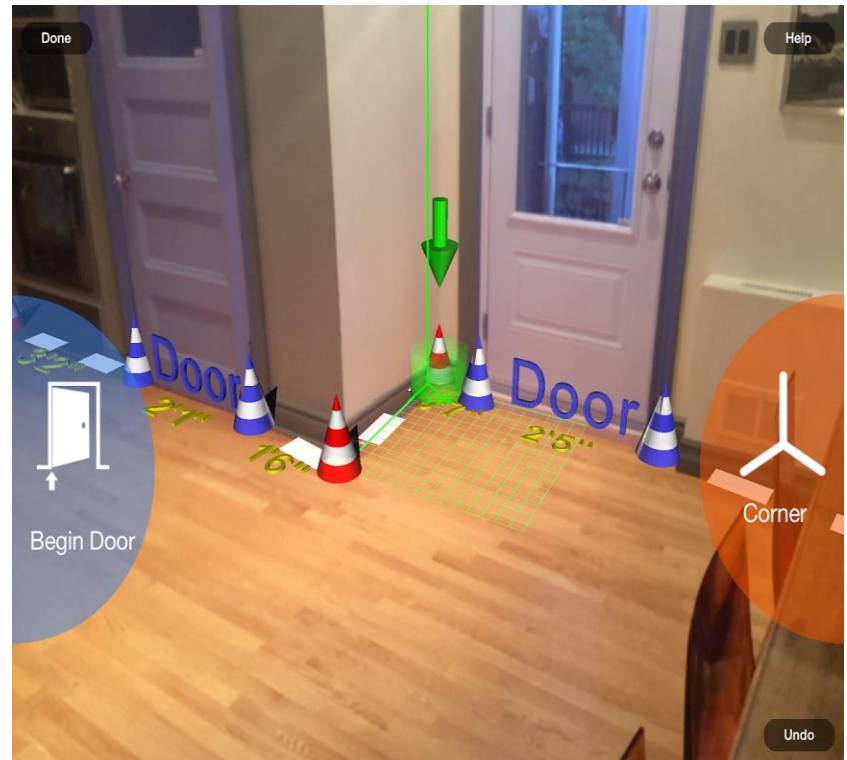
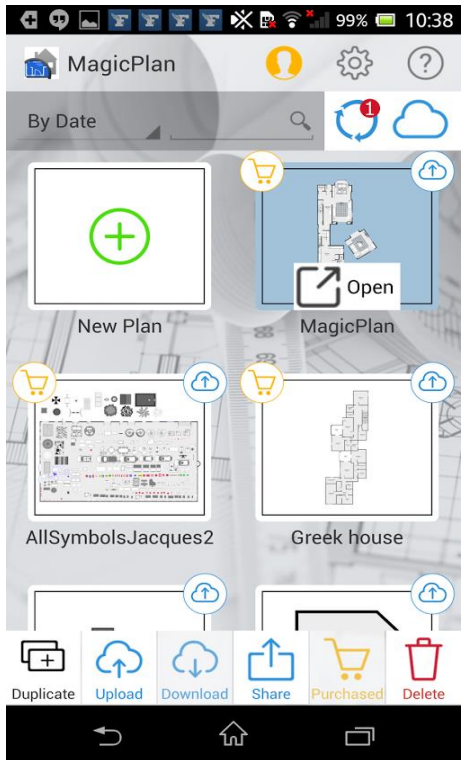


Dispositivos
móviles





MagicPlan





Available on the
App Store



GET IT ON
Google play



Available at
amazon appstore
for Android



Windows Store

Contador de Calorías diarias

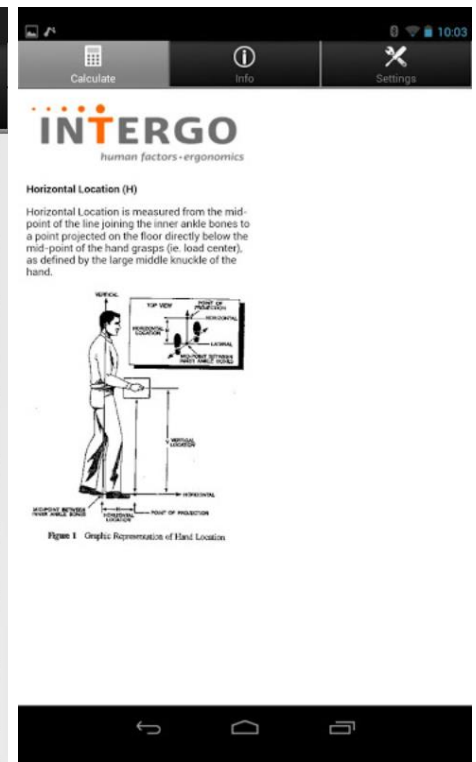
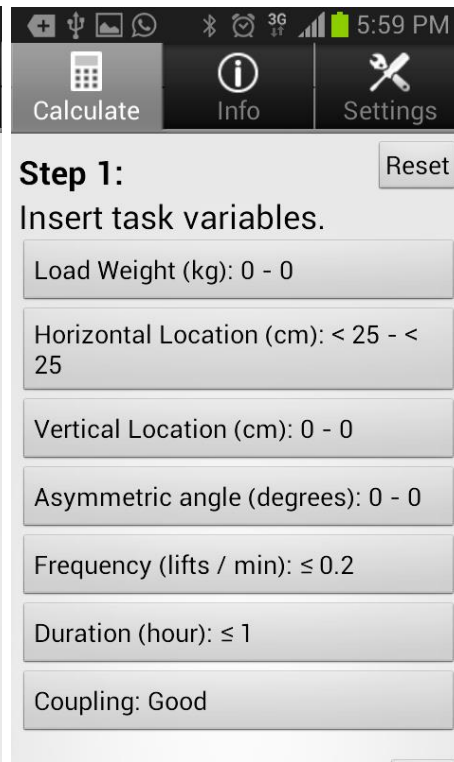
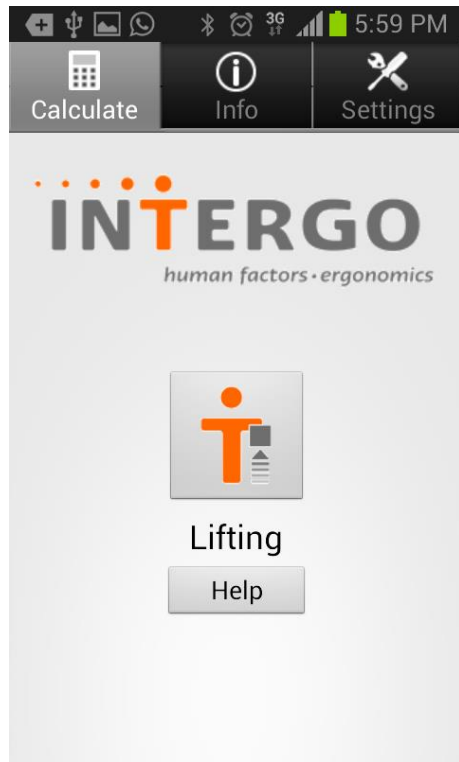




MMH Calculator



INTERGO by • Human





Available on the
App Store



GET IT ON
Google play



Available at
amazon appstore
for Android



Windows Store

Lift Right



< New Lift CLEAR

	origin	destination
Horizontal	0.62	0.56
Vertical	0.85	0.96
Rotation	1.00	0.90
Distance	0.94	
Frequency	0.65	
Coupling	1.00	

	Recommended Weight Limit (lbs)	Lift Index
ORIGIN	16.42	1.95
DESTINATION	15.08	2.12

Copiado al portapapeles

New Lift CLEAR

	origin	destination
Horizontal (in)	16	18
Vertical (in)	10	25
Rotation (deg)	0	30
Lifts/min	2	
Duration	<input type="radio"/> < 1 hr <input type="radio"/> 1-2 hr <input checked="" type="radio"/> 2-8 hr	
Coupling	<input checked="" type="radio"/> good <input type="radio"/> fair <input type="radio"/> poor	
Object Weight	32	

Calculate

< Back

Horizontal Angle

Vertical Location

The distance (inches/cm) from the hands to the floor. Measure this at the beginning (origin) and end (destination) of the lift.

Measure



Available on the
App Store



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Google play

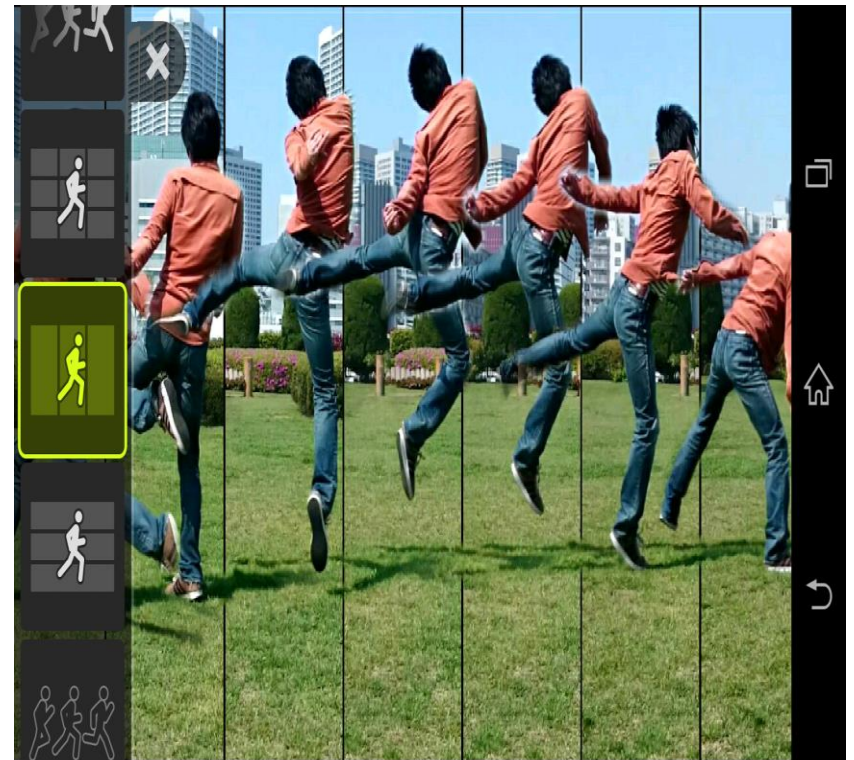


Available at
amazon appstore
for Android



Windows Store

Motion Shot





Available on the
App Store



GET IT ON
Google play



Available at
amazon appstore
for Android



Windows Store

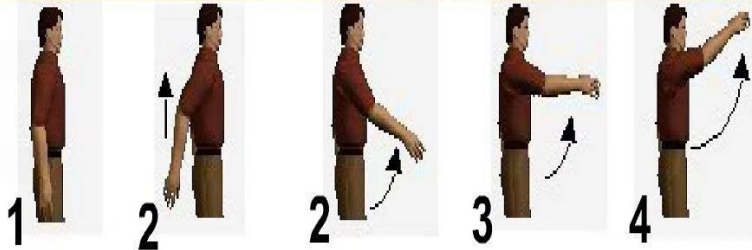
HSE.Ergo.RULA

UPPER ARM POSTURE:

U ARM ▾

NEXT ▶

- * If shoulder is raised or upper arm is abducted, add 1 mark
- * If upper arm is leaned or supported it's weight, decrease 1 mark



Score A

3

Score C

6

RULA SCORE

7

3

Score B

6

Score D

Result

NEXT ▶

Investigation and changes are required immediately



Carga postural - REBA



Análisis de posturas forzadas (método REBA)

NIPO: 272-15-034-1

GOBIERNO DE ESPAÑA
MINISTERIO DE EMPLEO Y SEGURIDAD SOCIAL
INSTITUTO NACIONAL DE SEGURIDAD E HIGIENE EN EL TRABAJO

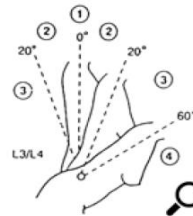


Carga postural-REBA

Entrada de datos:

Por favor seleccione y rellene todos los campos del formulario.

Flexión / Extensión del tronco:



- 1. Erguido
- 2. 0° - 20° flexión o extensión



Carga postural-REBA

Entrada de datos:

Por favor seleccione y rellene todos los campos del formulario.

Flexión / Extensión del tronco:

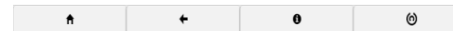


- 1. Erguido
- 2. 0° - 20° flexión o extensión
- 3. 21° - 60° flexión o > 20° extensión
- 4. > 60° flexión

¿Existe torsión o inclinación lateral?

- Sí
- No

Siguiente





HSE.Ergo.@WAS

Owas No: 2

Task code:

2	1	2	2	01
---	---	---	---	----

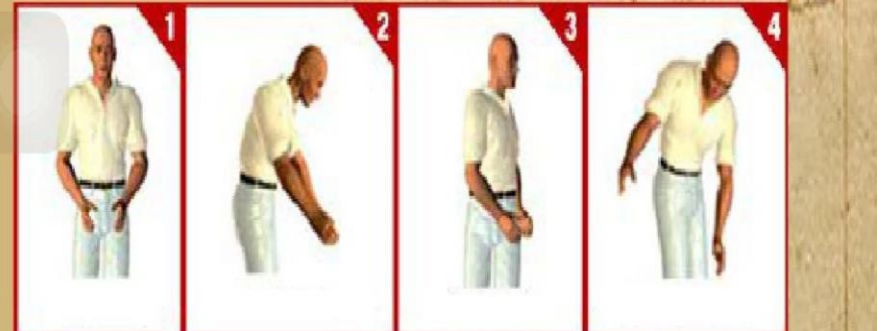
Trunk
Arm
Leg
Force
Work phase

RESULTS
NEXT

2- Slightly harmful - corrective action should be taken during next regular review of work methods

Trunk position:

TRUNK





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App Store



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Google play



Available at
amazon appstore
for Android




Windows Store

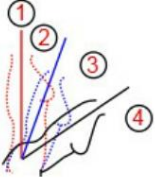
Rapid Entire Body Assessment



ScreenTrunk



?



Add 1 - 4 points according to the degree of flexion / extension

Extras: Add 1 if twisted or side flexed

Trunk Score Legs

Screen1

Rapid Entire Body Assessment

MHI
Moving & Handling Instructors

Start

About REBA

About MHI



Safe Lifting Calculator

Oregon OSHA Lifting Limit Calculator

1. Choose starting position
2. Select number of repetitions per minute and per hour
3. See affects of twisting

Safe Lifting Calculator
Oregon DCBS

DESINSTALAR ABRIR

1 MIL 3,9 Salud y bienestar Similares

Descargas 14 14

3. Your lifting limit is affected by the amount of twisting.

2-3 lifts every minute for over 2 hours

Over 45 degrees Under 45 degrees

Lift areas are white ▲ Lift areas are white ▲

22 Copiado al portapapeles lbs.

Return to start

2. Click a box that is the correct lifts per minute and hours per day.

Lifts per minute	Hours of lifting per day		
	1 hr. or less	1-2 hrs.	2+ hrs.
1 per 2-5 min.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1 per min.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2-3 per min.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4-5 per min.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6-7 per min.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8-9 per min.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10+ per min.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22 Copiado al portapapeles lbs.

Return to start

1. Click a box that is the beginning position of the lift.

Distance from body: 0" 7" 12"

Return to start

◀ Home



Available on the
App Store



GET IT ON
Google play

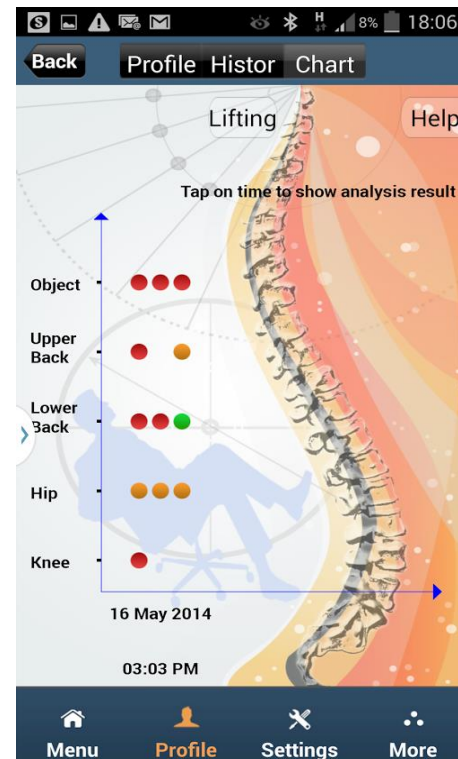
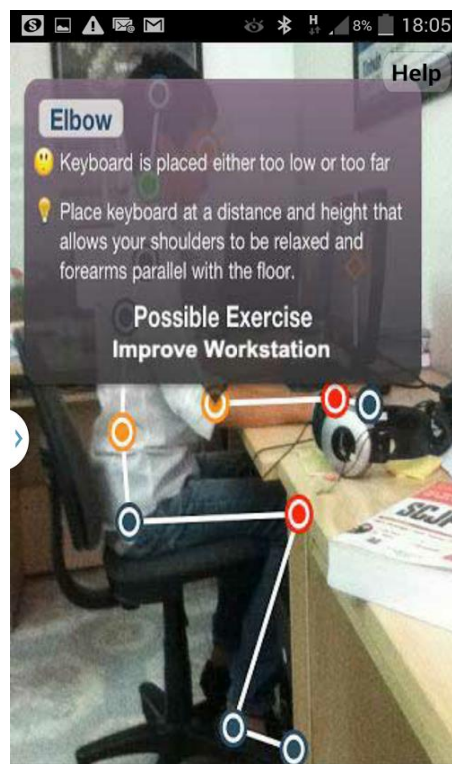
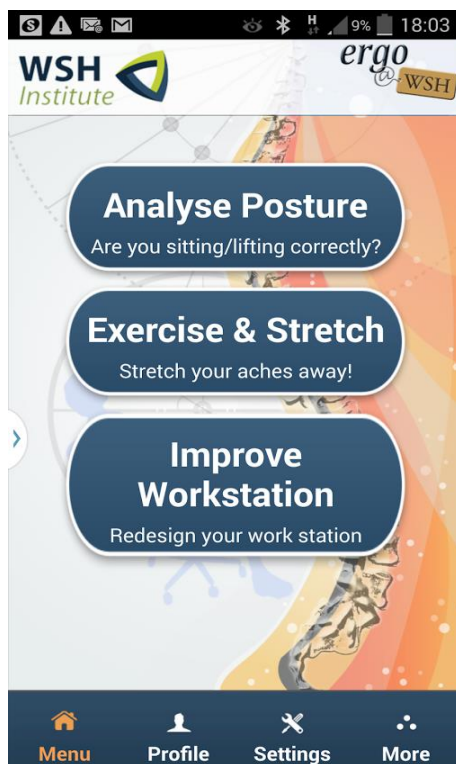


Available at
amazon appstore
for Android



Windows Store

ergo@W SH





Posture Check

歡迎使用



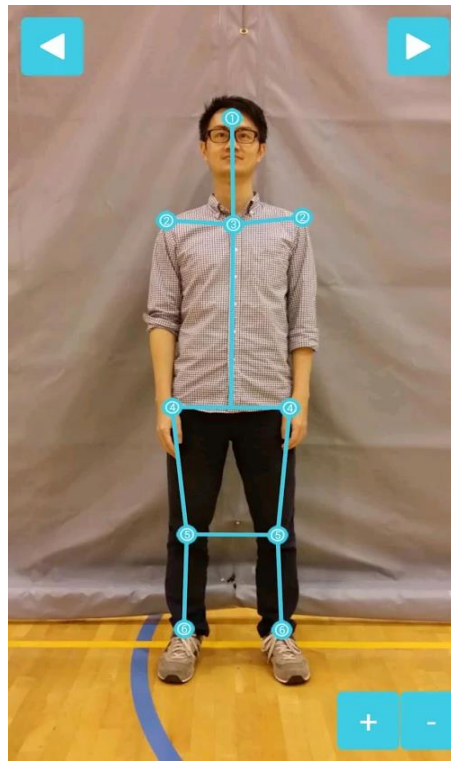
好知勢
Posture
Check

開始

記錄

脊醫列表

Created By CityU Apps Lab & CDAHK



結果

以下結果僅供參考



正面站姿分析

頭部: 無偏側

肩膀: 左邊肩膀稍高

盤骨: 無偏側

膝蓋: 左右平衡

腳部: 先天性膝內翻



側面站姿分析

頭部: 輕微傾前

肩膀: 圓肩或寒背

整體: 站姿正常



Available on the
App Store



GET IT ON
Google play

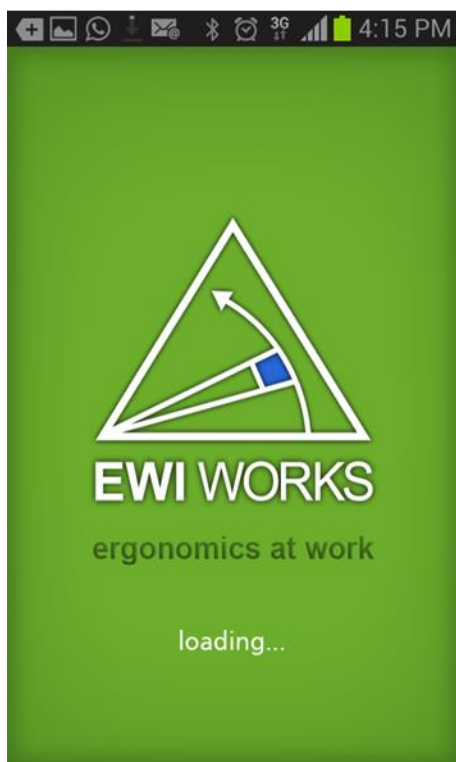


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amazon appstore
for Android



Windows Store

Office Ergonomics





Ergometer

← Ergometer

Ergometer
HazAnwar

DESINSTALAR ABRIR

100 Descargas 3,7 Herramientas Similares

NOVEDADES

- Added diagram
- Fixed scroll bar displaying on output page

Ergonometer

METRIC	IMPERIAL
Height of User	6 0
Length of Legs	2 10
Length of Arms	2 7

4
5
6
7
8
9
10
11

Submit

Ergonometer

Screen Distance
69.49 centimetres

Chair Height
449.07 millimetres

Keyboard Distance
0.44 metres

Screen Height
3 6 feet/inches

Convert

Ergonometer

Height of User millimetres

Length of Legs centimetres

Length of Arms metres

millimetres
centimetres
metres

Submit



3DSSPP

3dssApp

Off Results

Population Strength Percent Capable

Trunk Flexion		94
Shoulder		99

Low back Compression: 3384N

Off Controls

Anthropometry

Sex: Male Female

Height: 175.1 cm

Weight: 83.9 Kg

Select Hands or Hips to Change Posture 1/5

3dssApp

On Results

On Controls

Select Hands or Hips to Change Posture 4/5

3dssApp

Off Results

Population Strength Percent Capable

Trunk Flexion		97
Shoulder		99

Low back Compression: 1699N

On Controls

Select Hands or Hips to Change Posture 2/5



K+N Ergo App

← K+N Ergo App

K+N Ergo App
König + Neurath AG

DESINSTALAR ABRIR

1 MIL 4,3 Herramientas Similares

K+N Ergo App by König + Neurath

NOVEDADES

KÖNIG + NEURATH
Büromöbel-Systeme
www.koenig-neurath.de

K+N ERGO.APP
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Alle Rechte vorbehalten

Version 1.1

De En

KÖNIG + NEURATH

Table level

Wiederholen Vorschau Verwenden

KÖNIG + NEURATH

Chair and desk too low.
König + Neurath are happy to advise.

New Test Rotate Contact Evaluate



Available on the
App Store



GET IT ON
Google play

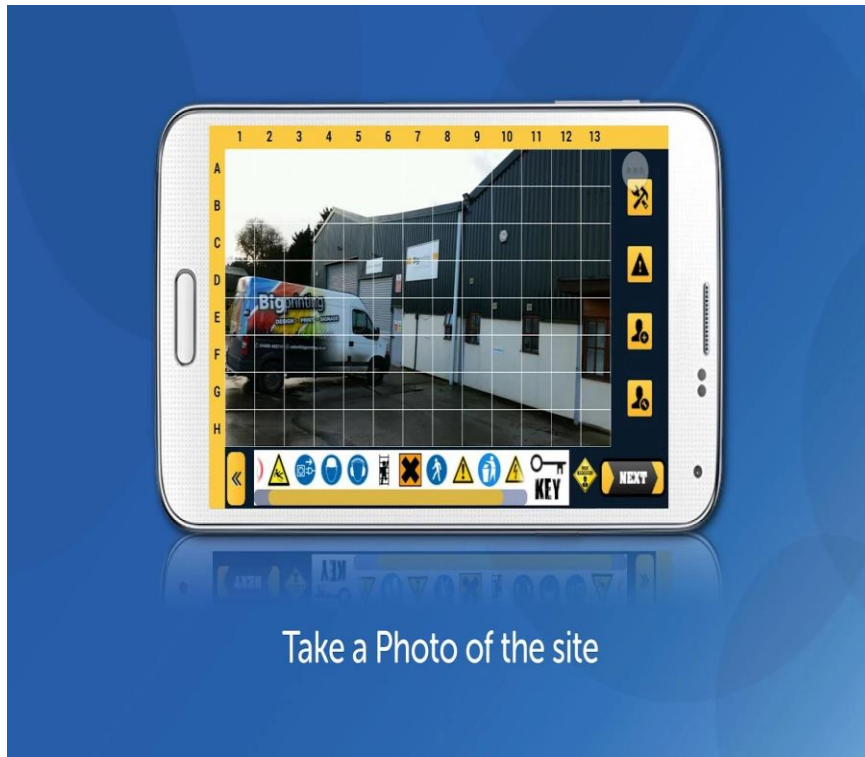


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amazon appstore
for Android



Windows Store

Risk Assessor



Check your Hazards and Controls
(and edit accordingly)





Available on the
App Store



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Google play



Available at
amazon appstore
for Android

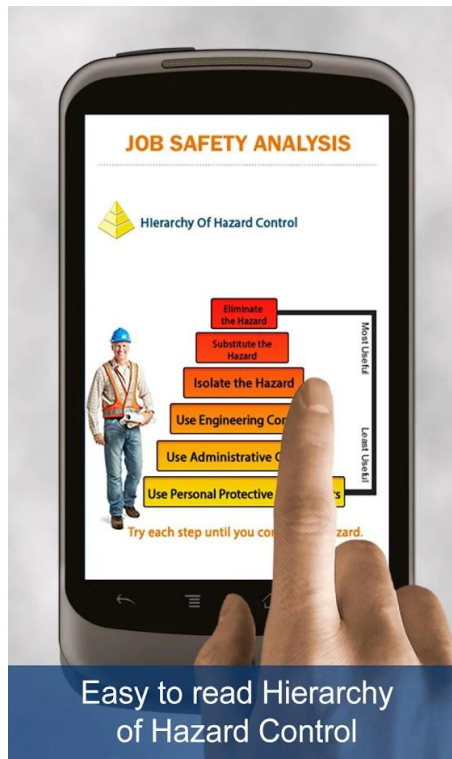


Windows Store

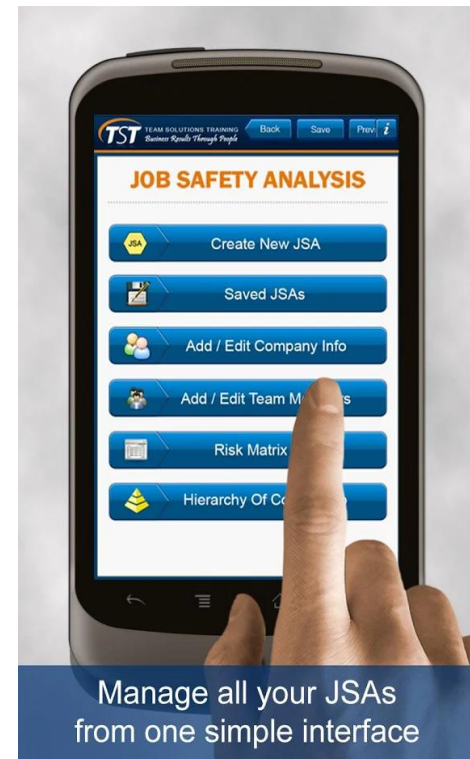
Job Safety Analysis



Engaging
Risk Matrix



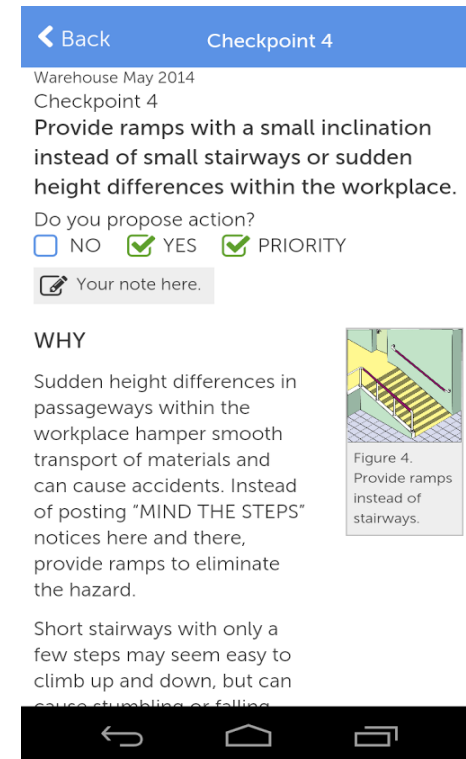
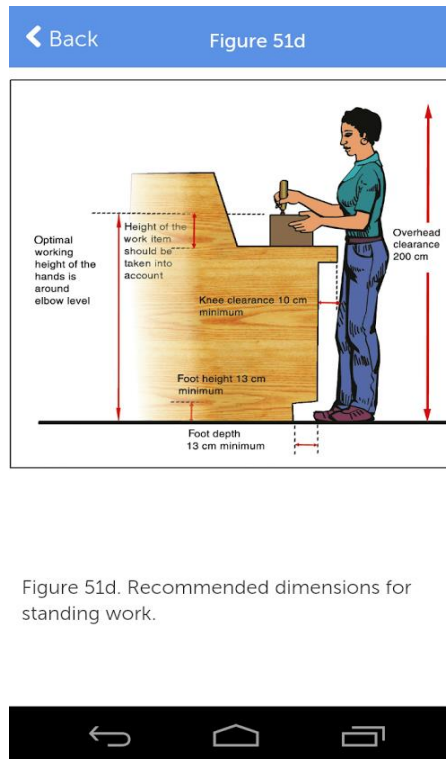
Easy to read Hierarchy
of Hazard Control



Manage all your JSAs
from one simple interface

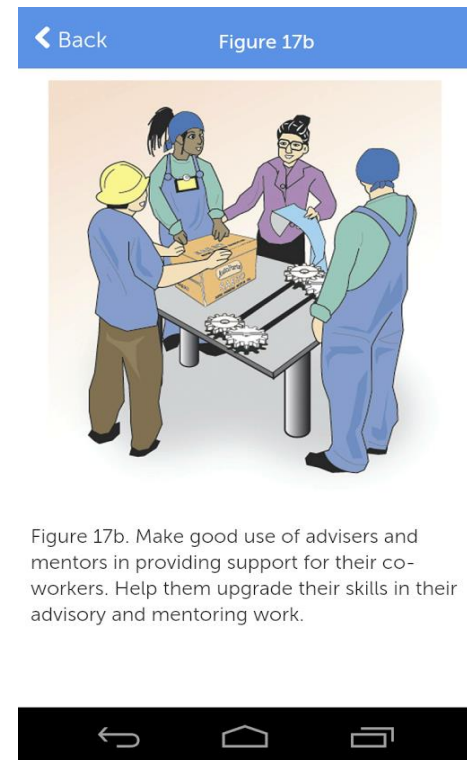
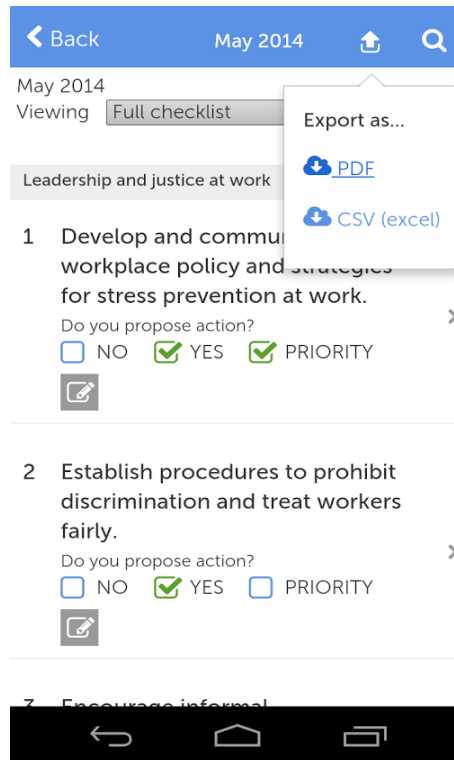
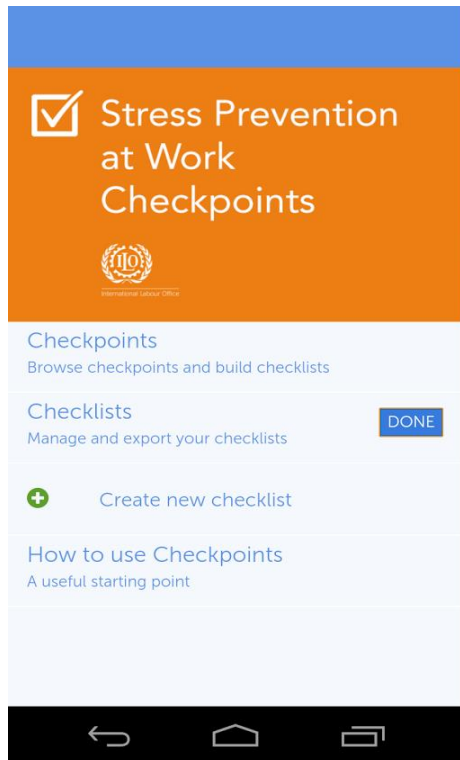


IL@ Ergonomic Checkpoints





IL@ Stress Checkpoints





Stress Check by Azumio



Stress Check measures your stress level by monitoring your heart rate

The process takes about 2 minutes. Please find a comfortable position and hold your phone steady during this time

Press START to start.



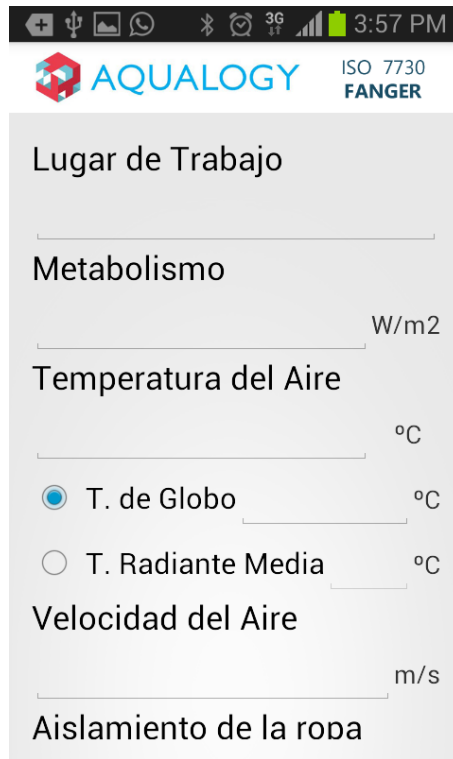
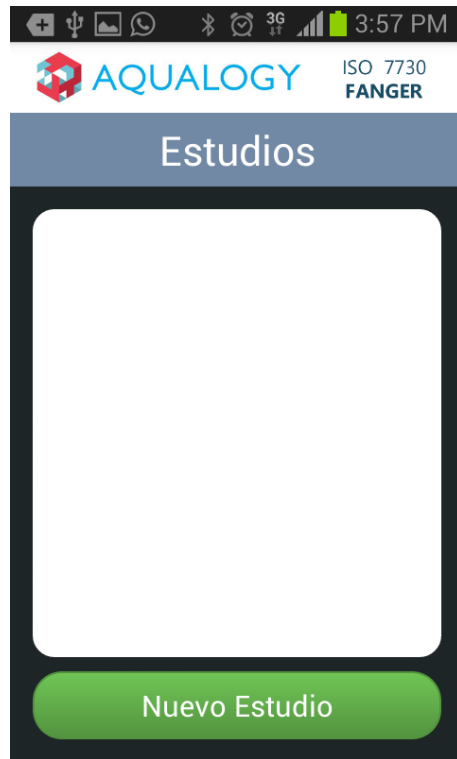
Measuring

I'm analyzing your heart rate variability to calculate your stress level. The whole process takes about 2 minutes.





Confort térmico





luxómetro

luxómetro

Aplicaciones

- 1. luxómetro KHTSXR ★★★★★ GRATIS
- 2. Light Meter Mannoun.Net ★★★★★ INSTALADO
- 3. Lighting calculat.. Ettore Gallina ★★★★★ GRATIS
- 4. Luxómetro Carles Sanz ★★★★★ GRATIS
- 5. Easy Light Meter Symbol Mobile

LUX METER

luxómetro KHTSXR

INSTALAR

50 MIL 3,7 Herramientas Similares

Descargas 596

Teléfono inteligente tiene una luz

calibration X 1.0

3138 lux

Max	3138
Avr	479
Min	15

RESET Calib

calibration X 1.0

Calibration

428 X1.34 lux

Max X0.5 X1 X1.5

Avr 410

Min 300

Default Save Cancel

RESET Calib



Sonómetro

← sonometro 🔍

Aplicaciones

1. Sonómetro - So...
Smart Tools co.
★★★★★ INSTALADO
2. Sound Meter PRO
Mobile Essentials
★★★★★ GRATIS
3. Sonómetro
Netigen Tools
★★★★★ GRATIS
4. Medidor de Deci..
TACOTY APP
★★★★★ GRATIS
5. Multi Measures
SkvPaw Co..Ltd

← **Sound Meter** 🔍

Sonómetro - Sound Meter
Smart Tools co.

DESINSTALAR ABRIR

10 MILLONES **4,2** ★★★★★

Descargas 126,465 Herramienta Similares

Mide el ruido ambiental con

Sonóme... pro 📷 MENÚ

68 dB
Smart Tools T

Para restablecer los valores, mantén pulsado el centro de la rueda.

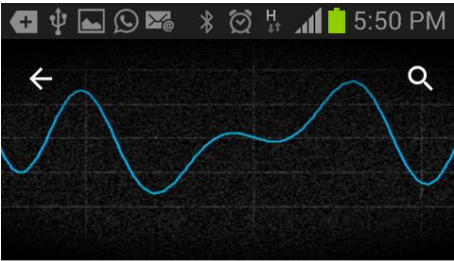
Sonóme... pro 📷 MENÚ

62 dB
Smart Tools 📈

- 90dB : Maquinaria de fábrica a 90cm
- 80dB : Calle concurrida, alarma de reloj
- 70dB : Tráfico intenso, teléfono sonando
- ▶ 60dB : Conversación normal a 90cm
- 50dB : Oficina silenciosa, calle silenciosa
- 40dB : Zona residencial silenciosa, parque
- 30dB : Susurro silencioso a 90cm



Análisis de Vibraciones



 **Análisis de Vibraciones**
ENGIN

DESINSTALAR ABRIR

1 MIL Descargas 3,8 18 Herramientas Similares

Una herramienta para

Vibrations Analysis

Please select the domain to show the signals in

Time domain
Time domain parameters
Frequency domain

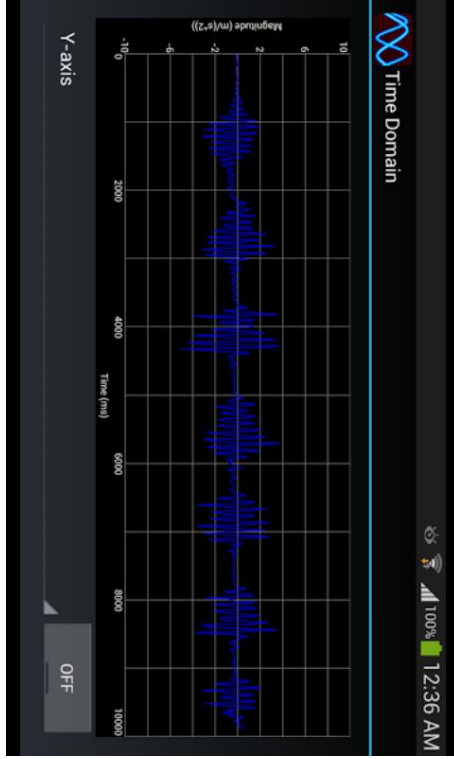
Time Domain

Magnitude (m/s²)

Time (ms)

X-axis OFF

Copiado al portapapeles





Max Protractor



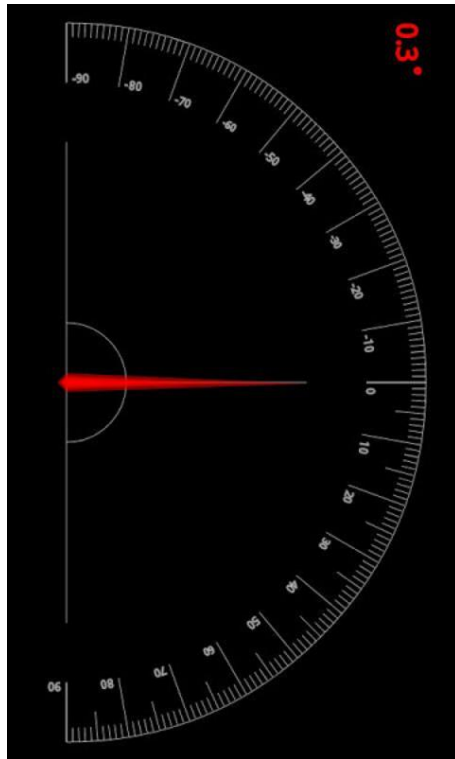
 **Max Protractor**
Maxcom

[DESINSTALAR](#) [ABRIR](#)

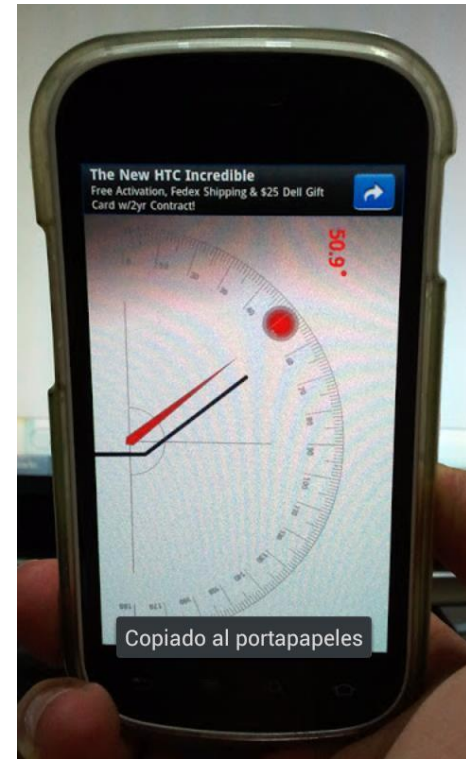
Descargas 439  Herramientas Similares

MaxProtractor



Mode List

- Inclination Mode
- Camera Mode(180°)
- Camera Mode(360°)
- Touch Mode(180°)
- Touch Mode(360°)
- Plane Angle Mode(180°)
- Plane Angle Mode(360°)





Tool Box (Free)

TOOLBOX

Tool Box (Free) Maxcom

INSTALAR

500 MIL Descargas

4,3 4,054 Herramienta Similares

ToolBox has everything just you want

Tool Box

Measuring Tools

- Compass
- Leveler
- Measure
- Protractor
- Vibrometer
- Mag Detec...
- Altimeter

Utility Tools

- Flash
- Converter
- Magnifier
- Calculator
- Abacus
- Counter
- Score Board
- Roulette

Time Tools

- [Clock icon]
- [Hourglass icon]
- [Ruler icon]

Leveler

P -0.3°

R -0.2°

Copiado al portapapeles

Set Origin Hold Restart

Max Converter

Kyrgyzstan Som	KGS	Kyrgyzstan Som	KGS
Ghanaian Cedi	GHS	Ghanaian Cedi	GHS
Australian Dollar	AUD	Australian Dollar	AUD
Aruba Florin	AWG	Aruba Florin	AWG
British Pound	GBP	British Pound	GBP

Exchange Rate

7 8 9 ←

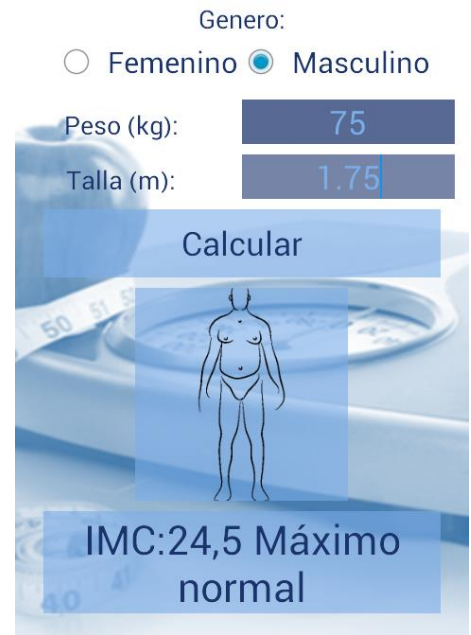
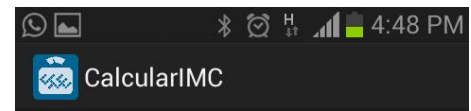
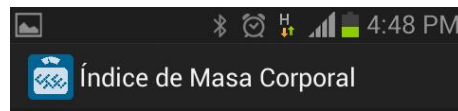
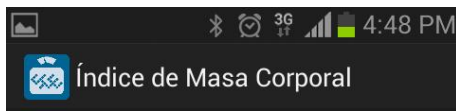
4 5 6 AC

1 2 3 +/-

0 . SWAP



SCE: Índice de Masa Corporal

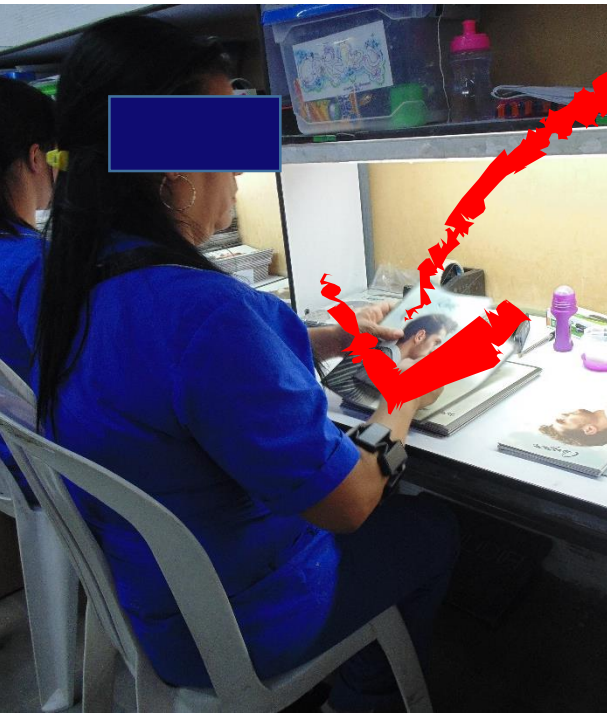
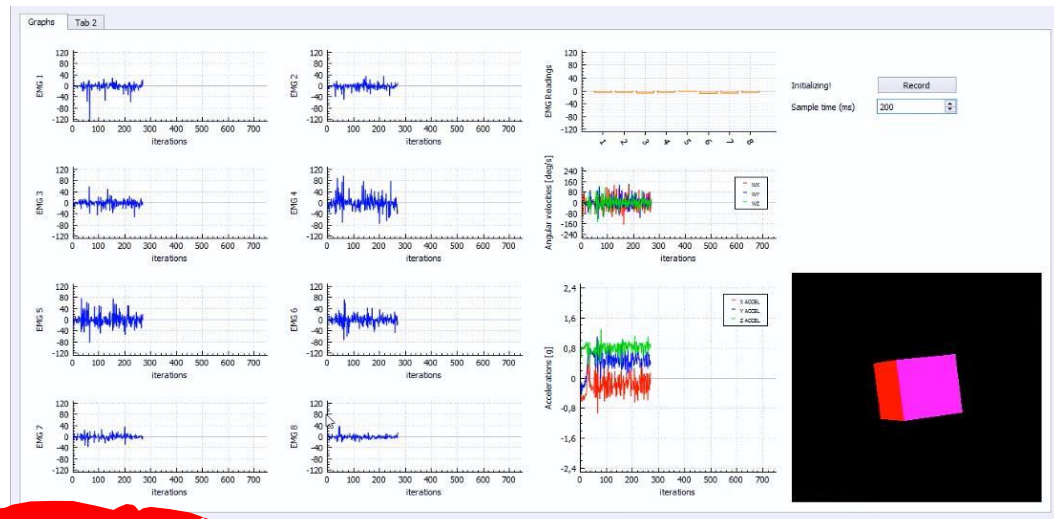


Las TIC

Dispositivos vestibles



Dispositivos vestibulares



Las TIC



Entornos
virtuales 3D

Manufacturing Operations in Virtual Environments (MOVE)



Antes de hacer algo, experimentalo en Realidad Virtual

Video 360°

Ambiente grabado en video que le permite al usuario experimentar y situarse en un escena real.

Usuario es guiado, permite movimiento

Monoscópico

Se puede ver en cualquier dispositivo

Video 360°

<https://www.youtube.com/watch?v=HEElzZ7UjRg>

Video 360°



Video 360° inmersivo



facebook 360

SPATIAL WORKSTATION

POWERED BY AUDIO 360

A free software suite for designing spatial audio for 360
video and cinematic VR



Realidad Virtual

Ambiente **generado** computacionalmente que le permite al usuario **experimentar** y situarse en un mundo completamente diferente

Usuario tiene el control, interacción y movimiento

Requiere dispositivos especiales

Estereoscópico o Monoscópico

Realidad Virtual



Dispositivos vestibulares

Interfaces Hápticas

feedback de fuerza

feedback táctil Feedback propioceptivo





Simlab Composer



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The Virtual Reality edition of SimLab Composer 8 is designed to take advantage of VR revolution for end users, and developers building specialized VR experiences with high quality visualizations of 3D software solutions.

Tecnomatix Manufacturing Simulation and Validation

The image displays the Tecnomatix Manufacturing Simulation and Validation software interface. The top portion shows a 3D virtual factory floor with two workers in blue and green shirts handling large black circular components on a wooden workbench. The bottom portion displays a detailed process flowchart with two parallel paths of steps: 'Step 1', 'Step 2', 'Step 3', 'Step 4', 'Step 5', 'Step 6', and 'Step 7'. Below the flowchart is a Gantt chart showing the timing of these steps for two different units, with a 'Current Time 0:00' indicator at the bottom right.

Tecnomatix Manufacturing Simulation and Validation



CATIA V5



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CATIA V5 STUDENT EDITION

Realidad Aumentada

Ambiente **enriquecido** computacionalmente que le permite al usuario **experimentar** y **visualizar** un mundo real, complementado con imágenes 3d.

Usuario tiene el control, interacción.

Incorpora información en el espacio.

No requiere dispositivos especiales

Estereoscópico o Monoscópico



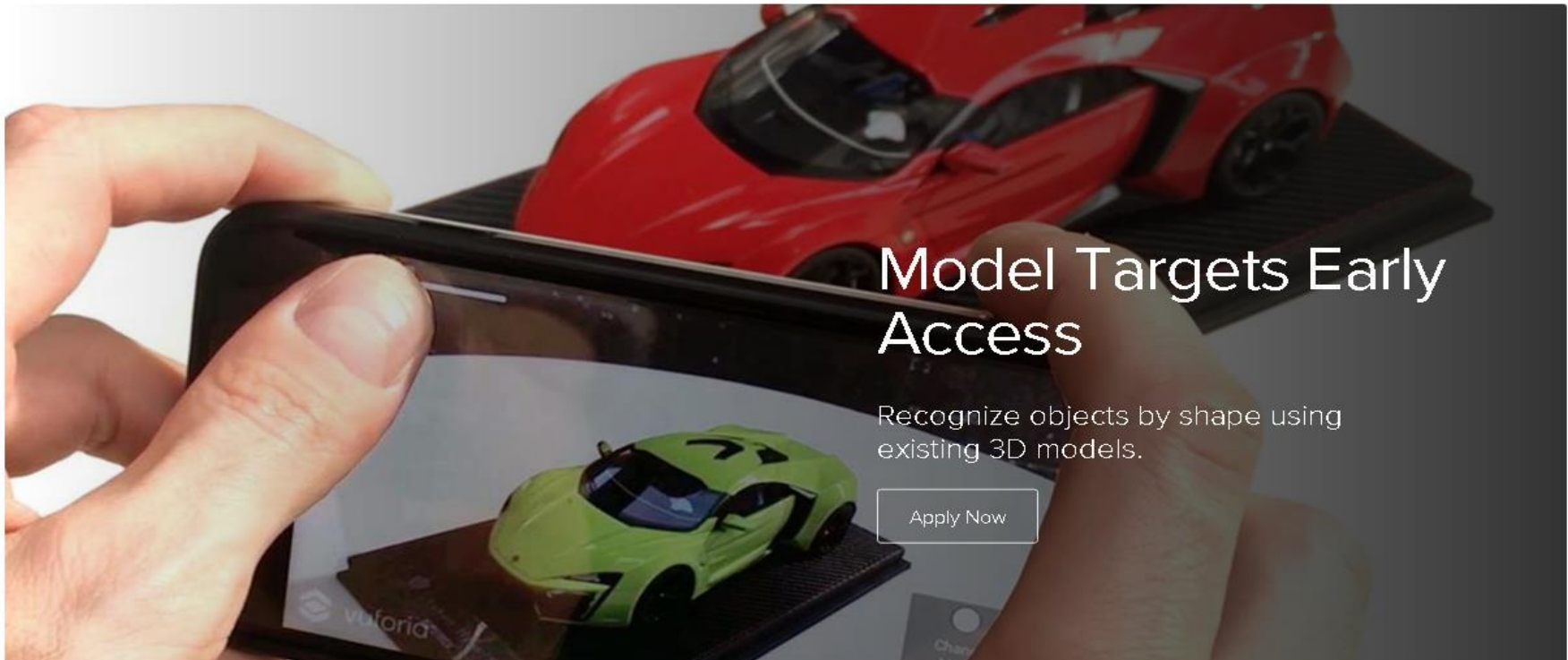


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Display products across ecommerce platforms in life-like, 3D augmented reality to drive sales and engagement.

Retailers

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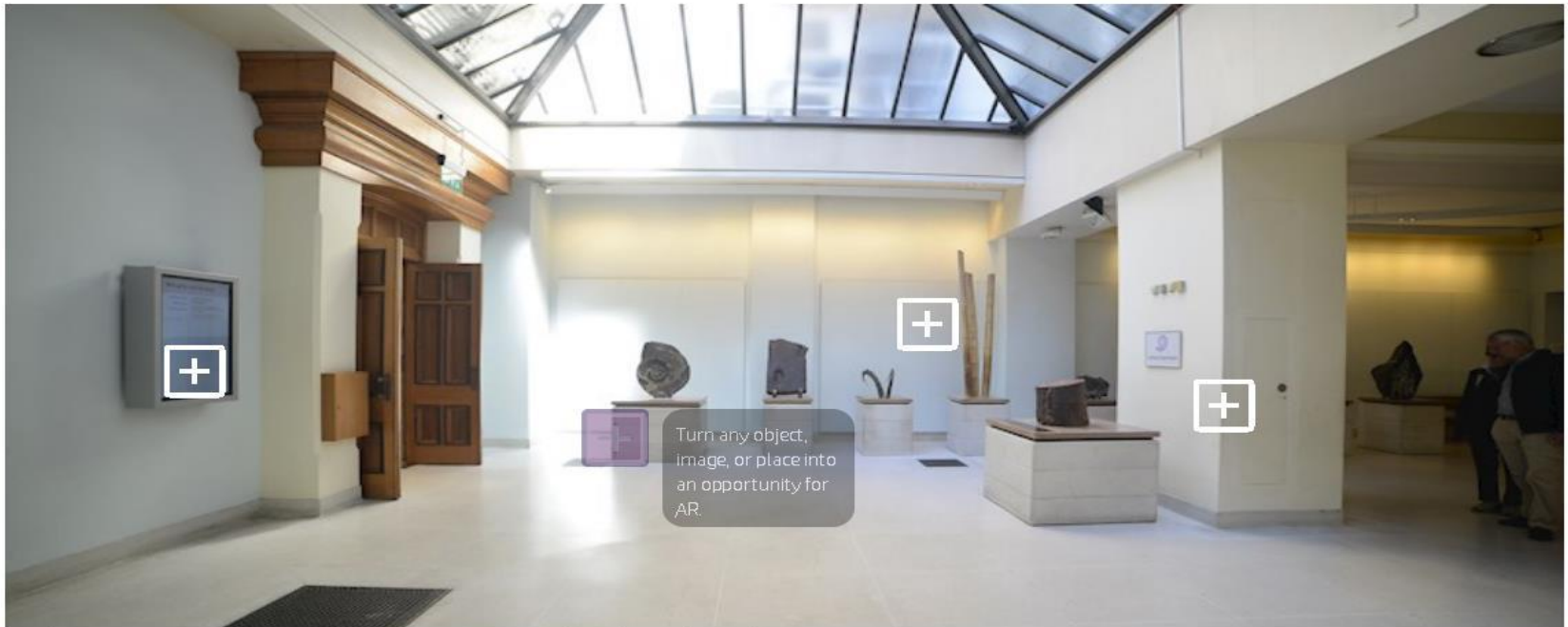
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Ergonomía y las TICs

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