SURGICAL
NAVIGATION
SYSTEMS

About Parsiss Company

The Image Guided Surgery group of Parsiss has started working on the design and implementation of a comprehensive IGS system since 2007 in Iran. This system not only offers the features of the existing systems in the market but also aims to implement new advanced features to overcome problems in more complicated surgeries.

Parsiss offers two different fully customizable platforms for developing surgical navigation solutions to guide the surgeon in a wide range of medical procedures. These systems use alternative tracking technologies and are designed to greatly reduce the time, cost and effort required for creating a certifiable state-of-the-art surgical navigation solution along with the richness of high navigation accuracy, fast visualization, segmentation and registration software platform.

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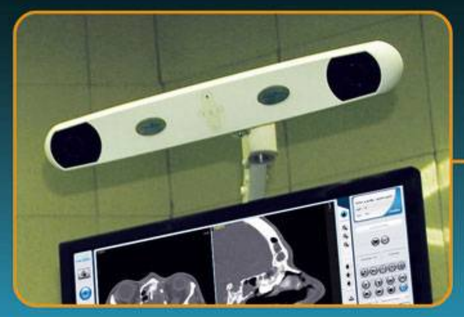
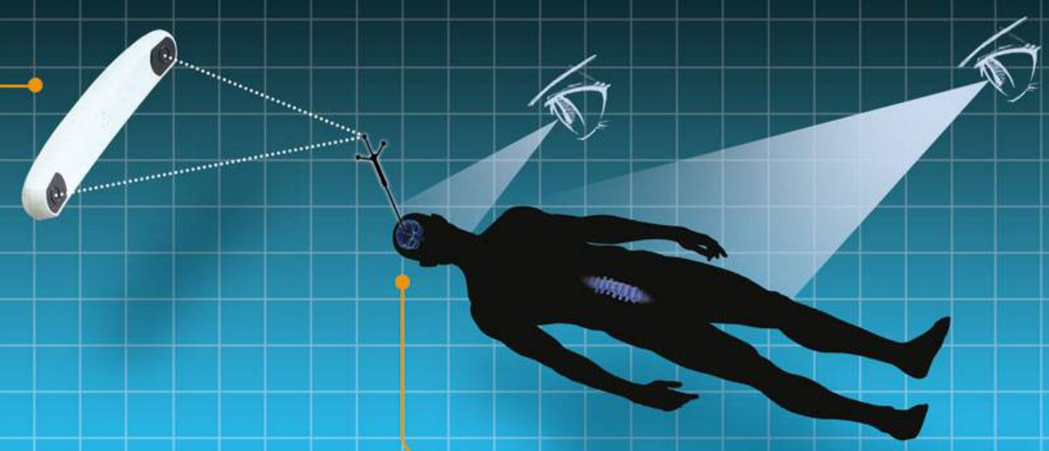


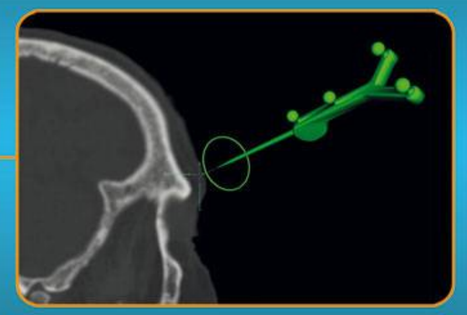


Optional procedures

- Define and segment critical 3D objects
- Path planning of the surgery
- Using multiple medical images simultaneously
- Connect to other medical devices

Main procedures

- Medical image acquisition before surgery
- Uploading medical images to the system
- 3D model construction from medical images
- Registration between medical images and patient in the surgery room
- Tracking instruments in the field of surgery by stereo camera
- Computing tooltip position in the surgery field and display on medical images



Navigation Principles

The medical community has increasingly focused on minimizing the invasiveness of surgical procedures. Advances in imaging technology and instrumentation allow minimal invasive surgery (MIS) through very small incisions to perform surgical procedures. A growth in this proportion will have many benefits for patients including fewer complications, shorter hospitalization, faster recoveries and reduced treatment costs.
The state of the art image-guided surgical navigation systems enhance surgeon's ability to navigate instruments and target specific anatomical structures. This system tracks the location of surgical tools and indicates their positions on patient-specific images already reconstructed from pre-operative image datasets similar to GPS system used to navigate a vehicle. These systems have been used predominantly in neurological, sinus and spinal surgery, where the need for precision and accuracy is of high priority and for which current IGS technology is best suited.

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OpticVision

One of the surgical navigation systems offered by Parsiss Company is OpticVision. The infrared tracker with no sensitivity to light are used in this system. OpticVision has all facilities to perform a complete, accurate and high quality surgery procedure. Various software features, high accuracy, having planning station and widespread surgical planning facilities including segmentation, automatic image to image registration and generating composite models have made this system as an ideal navigation system for neurosurgeries and ENT surgeries.

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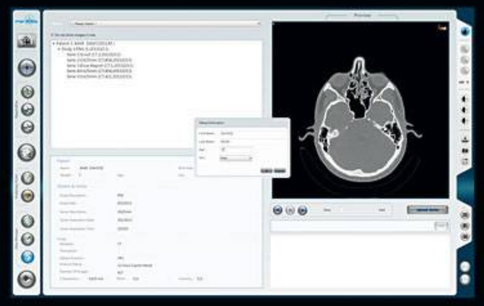
OpticVision Features



General Features

- Perfect design with small footprint and high maneuverability
- Easy positioning of the large display dedicated to surgeon
- Virtual key and foot switch to activate predefined system tasks
- UPS support to continue working in the case of power failure

Import & Manage Image Dataset

- Support different type of DICOM datasets, e.g., CT, MR and PET
- Import images from different media, e.g., DVD, CT and memory stick.
- Automatic detection of image dataset's problems
- Compatibility check of image datasets to comply with navigation requirements
- Orientation correction of image dataset
- Add new image dataset to the existing data intraoperatively

Image Fusion

- Accurate registration of images from different image modalities, e.g., CT and MR
- Fast and automatic registration, using advanced algorithms
- Fusion refinement using manually selected landmarks
- Fusion of image datasets with different voxel size and imaging field

Segmentation & 3D Reconstruction

- Automatic and fast segmentation of bone and skin from CT images
- Semi-automatic segmentation of the selected regions in different image modalities
- Capability to specify the VOI (Volume Of Interest) for segmentation
- Display sections of 3D models in standard 2D views
- Capability to define critical anatomical regions

Composite Modeling

- Fast and easy overlay of fused data and 3D models from different modalities
- Automatic validity check of the composite model
- Automatic correction of the composite model based on updated fusion results

Surgical Planning

- Preoperative simulation of surgical procedure in virtual environment
- Capability to set and modify target and entry points on 2D images or 3D model
- Capability to adjust visualization parameters of the surgical path, e.g., color and opacity
- Trajectory animation of the surgery approach

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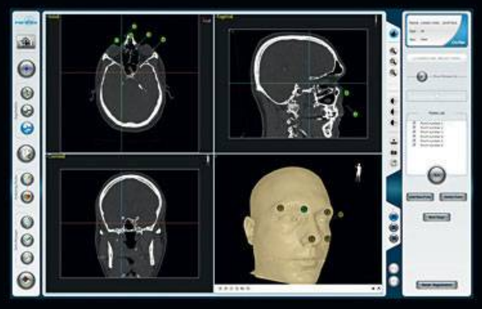
OpticVision Features



Tracking Device

- Support active and passive surgical instruments
- Automatic detection and validation & easy calibration of surgical instruments
- Handy and multiface instruments to facilitate surgical maneuver
- Optimal field of view adjustment of the tracker using laser pointer

Registration

- Display landmark registration error in 2D and 3D model for registration refinement
- Auto-capture of selected landmarks
- Automatic evaluation of the new captured landmarks
- Surface registration to achieve higher registration accuracy
- Inform final registration error

Navigation

- Capability to define check points for intraoperative verification of registration accuracy
- Real time display of distance between predefined target points and tooltip
- Dynamic 3D cutting of the model at current position of the tooltip
- Import and display video images during navigation ,e.g., endoscopic and microscopic images
- Capability to freeze images in order to review, measure and other operations
- Audio-visual alarm when the tracker misses the reference or tools
- Audio-visual alarm when the tooltip approaches to the predefined critical area
- Detect and compensate camera and patient displacement
- Auto-snapshot from surgeon's view of interest
- Intraoperative surgical simulation using virtual tip
- Auto-measurement of distance from tooltip to arbitrary points
- 3D distance measurement

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Selected Features

- Stand alone planning station with all demanded features
- Unique design to achieve maximum view of display
- Tracking device with extensive field of view
- Accurate and fast registration
- Extensive operation area coverage with two long articulated arms
- Review of surgery procedures by auto saved information

ImageVision

Parsiss Company offered a modern surgical navigation system, called ImageVision. The optical image trackers are used in this system. ImageVision has a wide range of facilities to perform a supersensitive and accurate surgery. Simplicity of the system and markers, various software features and high accuracy, make ImageVision as an appropriate option for the ENT surgeries.

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ImageVision Features

General Features

- Perfect design with small footprint and high maneuverability
- Easy positioning of the large display dedicated to surgeon
- Foot switch to activate predefined system tasks
- UPS support to continue working in the case of power failure

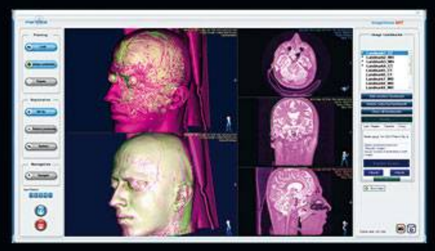

Image Import

- Support different type of DICOM datasets, e.g., CT, MR and PET
- Import images from different media, e.g., DVD, CT and memory stick
- Capability to manipulate patient information within image dataset
- Automatic detection of image dataset's problems

Review and Planning

- Fusion of image datasets from different modalities, e.g., CT and MR
- Manual refinement of fused datasets
- Automatic and manual segmentation of bone, skin, lesions, tumors, vessels, etc.
- Capability to manipulate the segmented regions (edit, measure, etc.)
- Capability to review and analyze the medical images in 2D and 3D views
- Define target points on 2D images or 3D model by user

Registration

- Suggestion of predefined anatomical landmarks
- Display landmark registration error in 2D and 3D views for registration refinement
- Auto-capture of selected landmarks
- Automatic evaluation of the new captured landmarks
- Surface registration to achieve higher registration accuracy
- Color map display of points, based on surface registration error
- Inform final registration error

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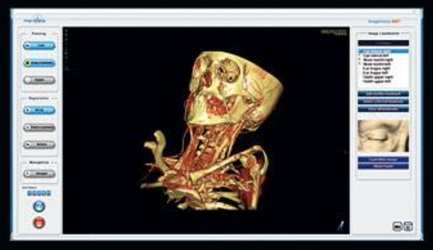
ImageVision Features

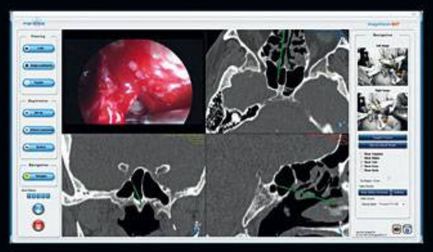
Tracking Device & Tool Support

- Fast and easy definition of surgical tools throughout the operation
- Handy and multiface instruments to facilitate surgical maneuver
- Capability to verify the accuracy of predefined tools during surgery
- Capability to define user tools by means of detachable adaptors

Navigation

- Capability to define check points for intraoperative verification of registration accuracy
- Real time display of distance between predefined target points and tooltip
- Dynamic cutting of the 3D model at the current position of the tooltip
- Import and display video images during navigation ,e.g., endoscopic and microscopic images
- Capability to freeze images in order to review, measure and other operations
- Auto-snapshot from surgeon's view of interest
- Auto-measurement of distance from tooltip to arbitrary points
- Audio-visual alarm when the tracker misses the reference or tools
- Detect and compensate camera and patient displacement





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Selected Features

- Unique design to achieve maximum view of display
- Tracking device with extensive field of view
- Accurate and fast registration
- Extensive operation area coverage with two long articulated arms
- Review of surgery procedures by auto saved information

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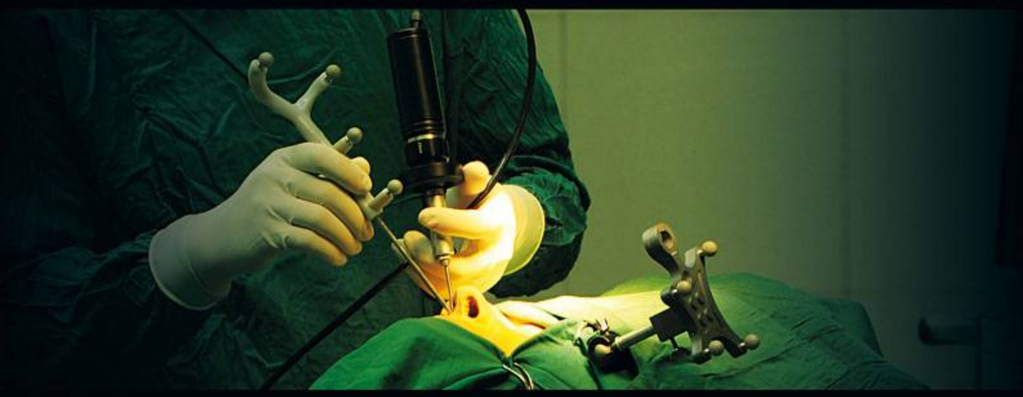
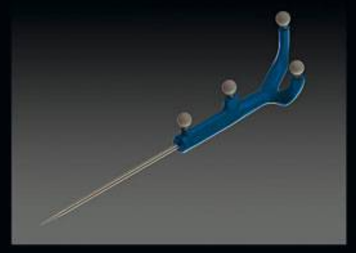
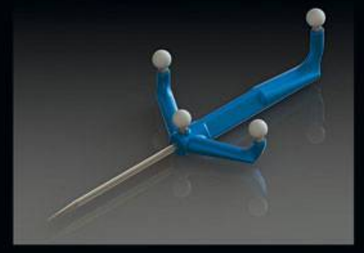
OpticVision Tools

- Handy instruments to facilitate surgical maneuver
- Proper design for extensive field of view
- Capability to use by left-handed and right-handed surgeons







OV Pointer I

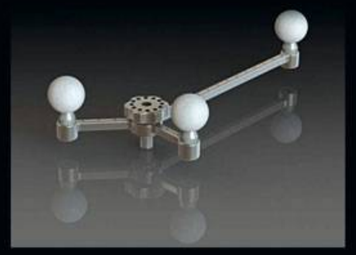
Serial Code: POQ 005 00 00
Dimensions: 60*300*50 mm
Tooltip Length: 153 mm
ToolTip Diameter: 4 mm
Handle Material: Aluminum 7075
Tooltip Material: Stainless Steel AISI 304
Weight: 90 gr
Autoclavable
Disposable Markers

OV Pointer II

Serial Code: POQ 007 00 00
Dimensions: 98*234*42 mm
Tooltip Length: 110 mm
ToolTip Diameter: 4 mm
Handle Material: Aluminum 7075
Tooltip Material: Stainless Steel AISI 304
Weight: 88 gr
Autoclavable
Disposable Markers

OV Reference/Calibrator/Virtual Key

Serial Code: POQ 008 00 00
Dimensions: 62*111*93 mm
Material: Aluminum 7075
Weight: 133 gr
Autoclavable
Disposable Markers



OV Marker I

Serial Code: PCQ 003 00 00
Dimensions: 60*76*24 mm
Material: Stainless Steel AISI 304
Weight: 24 gr
Autoclavable
Disposable Markers

OV Marker II

Serial Code: PCQ 004 00 00
Dimensions: 49*105*24 mm
Material: Stainless Steel AISI 304
Weight: 22 gr
Autoclavable
Disposable Markers

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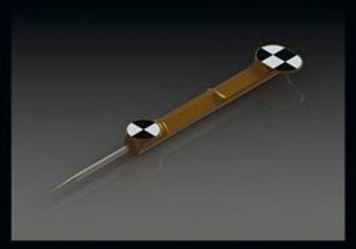
ImageVision Tools

- Handy instruments to facilitate surgical maneuver
- Proper design for extensive field of view
- Capability to use by left-handed and right-handed surgeons



IV Pointer I

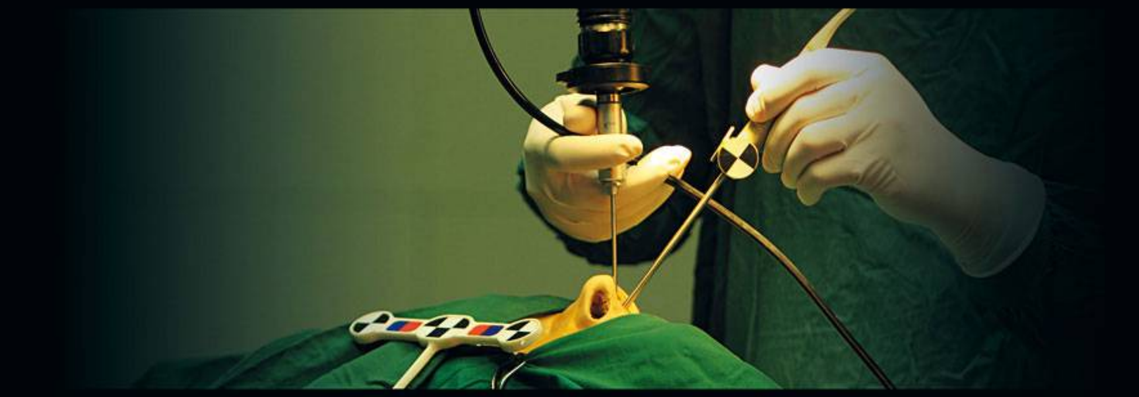
Serial Code: PIQ 001 00 00
Dimensions: 38*350*38 mm
Tooltip Length: 143 mm
ToolTip Diameter: 4 mm
Handle Material: Aluminum 7075
Tooltip Material: Stainless Steel AISI 304
Weight: 106 gr
Autoclavable

IV Pointer II

Serial Code: PIQ 002 00 00
Dimensions: 38*234*16 mm
Tooltip Length: 80 mm
ToolTip Diameter: 4 mm
Handle Material: Aluminum 7075
Tooltip Material: Stainless Steel AISI 304
Weight: 78 gr
Autoclavable

IV Reference

Serial Code: PIQ 005 00 00
Dimensions: 148*114*24 mm
Weight: 17 gr
Disposable



IV Marker I

Serial Code: PCQ 006 00 00
Dimensions: 36*74*15 mm
Material: Stainless Steel AISI 304
Weight: 27 gr
Autoclavable

IV Marker II

Serial Code: PCQ 007 00 00
Dimensions: 36*84*15 mm
Material: Stainless Steel AISI 304
Weight: 28 gr
Autoclavable

IV Calibrator

Serial Code: PIQ 007 00 00
Dimensions: 110*142*63 mm
Material: Aluminum 7075 & Titanium
Weight: 1100 gr
Autoclavable

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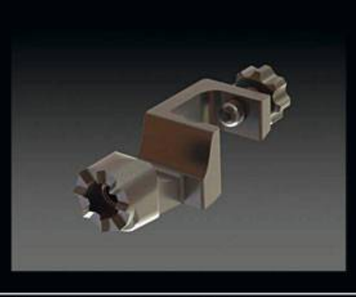
Common Tools

- **Easy attachment to surgical instruments**
- **Capability to attach the instruments with any angle**

Common Connector I

Serial Code: PCQ 001 00 00
Dimensions: 27*33*13 mm
Material: Stainless Steel AISI 304
Weight: 16 gr
Autoclavable



Common Connector II

Serial Code: PCQ 005 00 00
Dimensions: 14*41*13 mm
Material: Stainless Steel AISI 304
Weight: 17 gr
Autoclavable

Common Connector III

Serial Code: PCQ 002 00 00
Dimensions: 15*32*12 mm
Material: Stainless Steel AISI 304
Weight: 12 gr
Autoclavable

- **Different methods for head fixation**

Mayfield

Material: Titanium & Aluminum

Mayfield Connector

Serial Code: MCQ 00 00
Material: Stainless Steel 4021
Weight: 1200 gr
Autoclavable

Headband

Serial Code: PIQ 006 00 00
Weight: 24 gr
Disposable

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SUPPORTS

Warranty
All products of the Parsiss company includes warranties and after sale services.

Preventative Maintenance
Regular operational and maintenance checks are carried out within agreed intervals, including necessary repairs and upgrades, to keep the system in a performance optimizing condition.

Emergency Service
Trained service personnel are constantly available whenever any operating problem occurred.

Customer Training
We train surgeons and operating room staffs, giving them the necessary knowledge and resources to adequately operate with Parsiss navigation system.

System Upgrades
New software developments become available as we strive for continuous development. By implementing these you can improve system performance and reliability even further.

Operating Room Experts
Dispatch operating room experts for each surgery which used Parsiss navigation system.

Special Support
Manage extended warranties and service contracts.

Parts Supply
Guarantee to provide spare parts including hardware, instruments and mechanical parts.

CERTIFICATE NO. 44501

CERTIFICATE NO. 44501

Electrical Safety Standards:
IEC 60601-1-1, IEC 60601-1-2,
IEC 60601-1-4
Class I, Type B