NOUSE

Intelligent Vision Interface

Quick Start Guide

Version 2.2

Issue 2 – June 2014

Nouse – Quick Start Guide

Version 2.2

Issued – June 2014

The following third-party products are used by Nouse Applications Suite:

- IBM is a registered trademark of International Business Machines Corporation.
- Java is a trademark of Sun Microsystems, Inc.
- Microsoft, Visual Studio, Visual C++, Windows, Vista, Windows XP, and Windows 7 are registered trademarks of Microsoft Corporation.
- OpenCV Toolbox is a registered trademark of Intel Corporation.
- All other product names are trademarks or registered trademarks of their respective companies.

Table of Contents

Preface

Purpose

Nouse or "nose as a mouse" is a technology that enables users to control the computer mouse pointing device hands-free using only a webcam as an input device and the movement of the user's nose. The unique, patented technology uses advanced video recognition algorithms to map the movement of the user's nose to the movement of a computer mouse device thereby allowing a user to operate a computer hands-free. This User Guide will navigate the user through the use of the technology and provide information on its various features and functionality.

Audience

Nouse application was developed for anybody to use, however, it will be most useful for those computer users who have difficulty using their hands to manipulate a mouse or keyboard, or for those who want to take breaks from using their hands due to fatigue/injury. The solution is targeted for an older child or adult whose physical limitations (strength, range of motion) make using their hands/arms for operating a computer difficult or fatiguing.

The ideal Nouse user needs to have good control of their neck movement, as well as an ability to learn new computer skills. Their vision (with or without glasses) must be sufficient to see and follow the cursor around the screen. Nouse does not create more eye fatigue than standard computer use.

A Nouse user does not need to have full neck range of motion, as Nouse can be operated by very small neck movements in all 4 directions. Nouse is well suited to people with cervical spinal cord injuries, ALS or brain-stem stroke. A person with a slight tremor could use Nouse when settings and targets are adjusted to accommodate for their condition, however a person with significant tremor or spasticity would likely not be a suitable candidate.

Computer experience would be an advantage, but not at all necessary to learn how to use Nouse.

This User Guide assumes that the user has a basic knowledge and understanding of Windows applications, Web browsers and concepts such as double-clicking, menu bars, and dialog boxes.

Graphics

The appearance of graphics found in this document may vary according to the site configuration and operating system used.

Related Documentation

The following documents should be used in conjunction with Nouse Quick Start Guide:

- Nouse User Guide
- Nouse Settings Guide
- Nouse Training Video (Available to registered Users).

Chapter 1 – Welcome to Nouse

The ability to use computer technology is almost mandatory in today's society. Many aspects of everyday life, including schooling, shopping, banking, business, personal and employment require interaction with a computer. For those who find working with a physical keyboard and mouse cumbersome or have a disability due to disease or injury that prevents them from using a computer, have lost one of the most important communication mediums in the world today. This limits their ability to socialize, to entertain, to work, to use the advantages of the internet and to feel they are a part of society.

As computers become more and more integrated into our daily lives, we need to ensure that Assistive Technology (AT) is there to allow people with an arm or hand disabilities to be able to operate computers. A growing area of AT is hands-free computer technology that allows users with a disability to control a computer mouse and keyboard using other parts of their body such as the nose. Using the movement of other parts of your body can provide a different method for executing common tasks, such as pointing, clicking, and typing.

Nouse or "nose as a mouse" is a technology that enables users to control a computer hands-free using only a webcam as an input device and the movement of their nose. The unique, patented technology uses advanced video recognition algorithms to track the user's nose and map the movement to the mouse pointing device of a computer. This allows a computer user to operate a computer hands-free using their nose.

Essentially, Nouse is recognized as the first technology to use the nose as the principle feature for facial tracking, a process that involves setting up a webcam on a computer equipped with tracking software. The computer registers an image of your nose and then maps it onto the on-screen cursor, which you control with the movement of your nose. The nose's convex shape enables the computer to track movements with dramatically improved precision over traditional methods. Even if you turn your head to either side, the nose will always be within view of the camera, unlike the eyebrows or the mouth, which were formerly used for facial tracking.

Unlike other systems currently available to individuals who cannot easily access a computer using their hands, Nouse requires only Nouse software and a webcam. This makes Nouse extremely attractive as it is more affordable and portable than current systems.

The key functions of Nouse application include navigation of a computer mouse pointer (i.e., cursor movement) and mouse actions (e.g. click), voice recognition, and keyboard operations.

Chapter 2 – Nouse Documentation

Before getting started, the user must first install Nouse application. Chapter 3 of this guide provides the user with details on how to install Nouse application.

In addition to this guide, Nouse application provides the user with a User Guide and a Settings Guide. The User Guide document is designed to assist the user in understanding the basics of Nouse application and the Settings Guide how to configure it to suit their personal needs. To optimize the use of these guides the user should take the following steps when getting started:

(1) Refer to this guide for installation
(2) Refer to the User Guide for an overview of the basic features
(3) Refer to the Settings Guide to customize Nouse configuration to suit the user's unique setup needs.

Chapter 3 – Installing and Starting Nouse

The following section provides instructions on how to install Nouse application.

3.1 System Requirements

A Nouse computer is required to have a minimum of 2 Giga Hertz Central Processing Unit (CPU), 2 Giga bytes of Random Access Memory (RAM), and a Universal Serial Device (USB) Webcam and Nouse installation software. Nouse application will operate on Microsoft Windows XP, Vista and Windows 7 operating systems.

3.2 Installing Nouse and Third Party Applications

Before Nouse application can be utilized there are a number of third party products that may need to be installed. The user is required to review each section below before installing Nouse application.

All documentation that is provided with Nouse application will be in Adobe format. If you have not already downloaded the Adobe Reader then visit **http://www.adobe.com/** and download the latest version of the reader.

3.2.1 Installing Java Runtime Environment

The Java Runtime Environment (JRE) is needed to run Nouse Settings program. Many of today's applications already utilize the JRE and so it may already be installed on your computer. If you have not already installed the JRE then go to http://java.com website and download the latest version.

3.2.2 Installing a Webcam

Nouse requires the installation of a Universal Serial Device (USB) Webcam. The user should follow the standard installation instructions provided with the Webcam product. Note the Webcam should be hooked up to the computer screen and should be directed towards the users' face.

3.2.3 Installing Speech Application (optional)

Although Nouse application provides a default method to perform standard mouse clicks, there is the option to utilize Voice commands. Voice commands can be used to skip certain actions/clicks and generally make Nouse activities faster and easier. If the user plans to utilize "Voice Commands" a speech recognition application must be installed. Microsoft Windows provides a Speech application that can be used with Nouse. The user must ensure there is a properly configured microphone plugged into the computer.

To install the Microsoft Windows' Speech application the user must select "Start" then "All Programs" then "Accessories" then "Ease of Access" and finally the "Windows Speech Recognition" program. The user should follow the instructions for proper installation. Note the user will need to "train" the operating system to learn the user's voice in order for Nouse application to better understand the incoming voice commands. Refer to the user help file that is provided with the Speech application to ensure proper use and configuration.

3.2.4 Installing Nouse Application

Nouse application is ready for installation on your computer either via the website download or CD depending on the user selected preference. Nouse installation follows the standard Window installation process and is easy to complete. If the user has selected the CD option then the computer will need a CD reader attached to the computer.

Install Nouse using the CD:
- Insert the CD into the drive
- In Windows, open the directory to the CD drive under "My Computer" and select the CD drive.
- Double click on Nouse-Installer-2.1.exe file.
- Follow the instructions on the screen

Install Nouse using the Web Site Download:
- Use Windows Explorer to go the location of the downloaded file on the computer.
- Double click on Nouse-Installer-2.1.exe file.
- Follow the instructions on the screen

INSTALLATION NOTE: The user must have read/write permissions in the directory where the Nouse application is installed. By default the application is installed on the user's desktop.

3.3 Using the trial version

The trial version of the Nouse software is time-sensitive and will stop running seven (7) days after the user installs the software. The user must purchase and install a product key in order to have indefinite access to the Nouse software.

For the trial version the user will be reminded to install the product key on each start of the Nouse application during the seven day period until the product key is installed. If the user does not install the product key within the seven days the user will not be able to access the software and the software will stop running.

3.4 Installing the License Key

When the user has purchased a licensed copy of the Nouse the user will be sent an "Activation Instructions" email with the license key information. Below is an example of the activation information sent in the email.
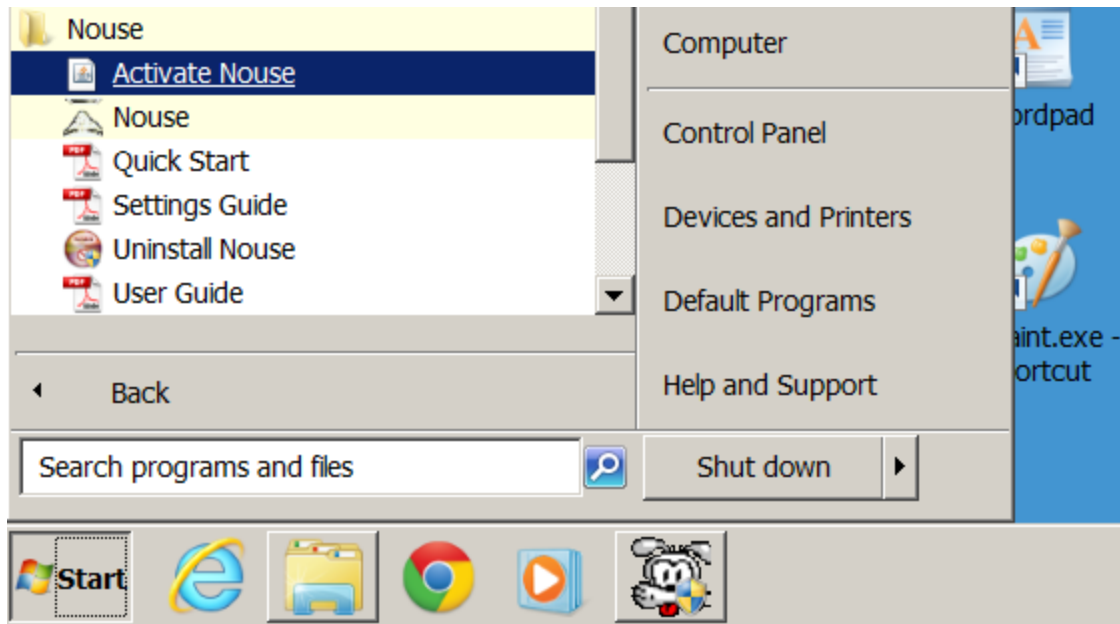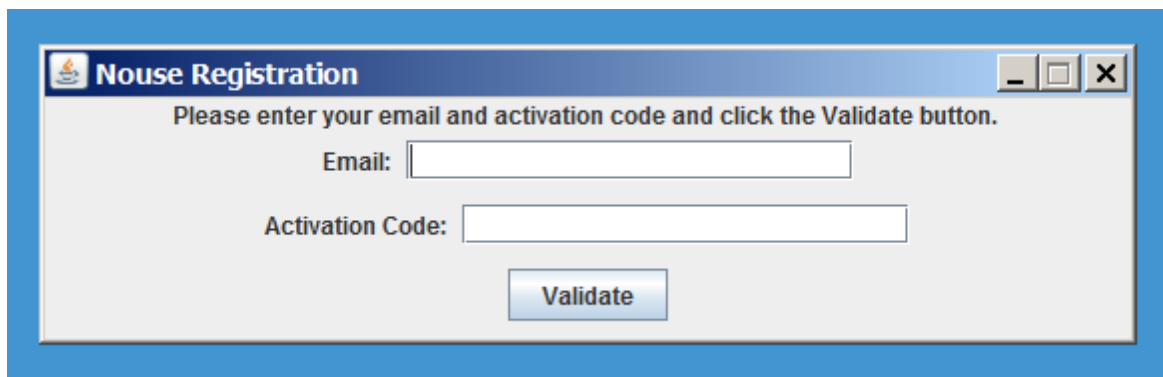
Name: Joe Smith
Email: Joe.Smith@gmail.com
Activation: k=c3i_#E}zTH

In order to install the license key the user simply launches the activation program. Users can access the program by clicking on the windows "Start" button (found in the bottom left hand corner of the screen), then clicking on "All Programs", then Nouse folder and finally click on Activate Nouse icon. Figure below displays Activate Nouse Program being launched.
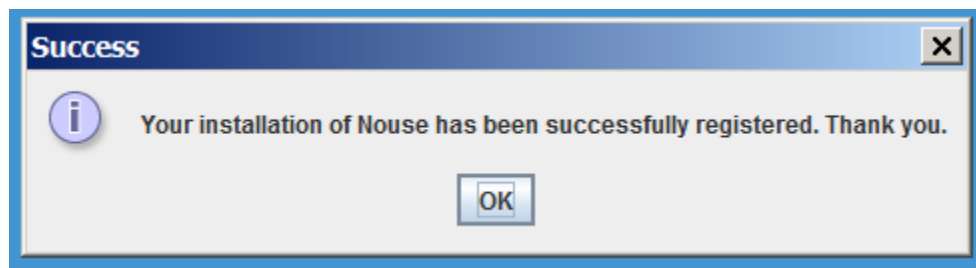
Once the program is launched the user will see a Nouse Registration window in the top left hand corner of the screen as in the figure below:

To finalize the registration the user must enter the Email and Activation Code found in the "Activation Instructions" email received by the user. Once the information is entered the user can click on the "Validate" button. The user will receive the following message if the Email and Activation Code are entered correctly.

The user has completed the registration process and can launch the Nouse application. If the user gets an "Activation Code Invalid" error message during the registration process the user needs to confirm the

Email address and Activation code match the Email and Activation Code sent in the Nouse Activation Instructions

3.5 Positioning in Front of the Webcam

Nouse user should be seated comfortably in front of their computer. The ideal distance away from the webcam is approximately an arm's length. The webcam should be directed toward the user but a specific angle is not needed.

3.6 Nouse Settings

Nouse application is installed using Nouse default settings however, the application has a myriad of settings and configurations that can be modified by the user to suit their personal preferences.

These settings are broken down into basic and advanced settings. The basic settings are options that most users will be expected to modify at some point, while the advanced settings may likely only be used by experienced Nouse users.

A detailed description of all the settings and configuration can be found in Settings Guide.

3.7 Launching Nouse Application

Once everything has been installed and setup, the user can start Nouse application. The application provides the user with three methods for starting the application. Each method is summarized below:

Note – Before starting the application the user should read through Chapter 3 of the User Guide to get an overview of the basic features of Nouse.

(1) Nouse application installs Nouse launch icon in the Windows application launch menu system. Users can access Nouse launch icon by clicking on the windows "Start" button (found in the bottom left hand corner of the screen), then clicking on "All Programs", then Nouse folder and finally click on Nouse icon. Figure 3.1 displays Nouse application launch icon.

Nouse

Figure 3.1 – The launch icon for Nouse application

In addition to Nouse launch icon, the application provides the user with launch icons for this Quick Start Guide, the User Guide and the Uninstall program. Figure 3.2 display Nouse application launching icons.
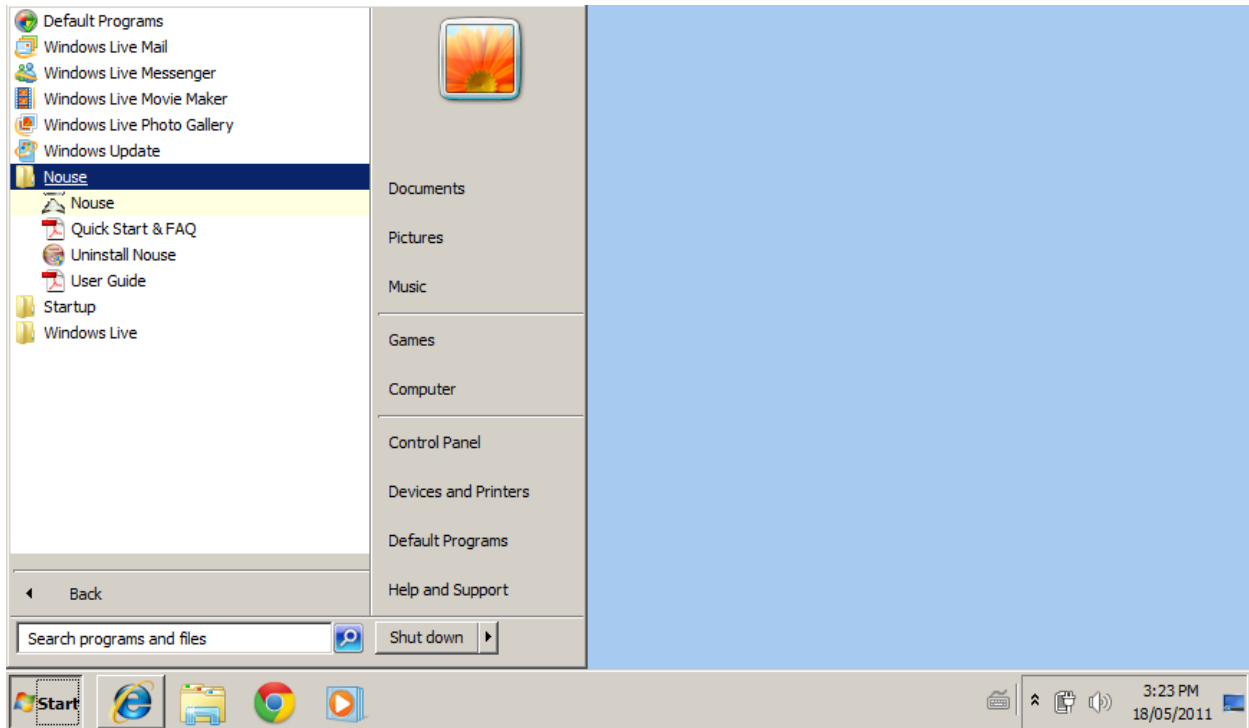
Figure 3.2 – Starting Nouse application from Windows Start Menu

(2) Auto Startup – Nouse installation process automatically sets up Nouse application so that it will automatically start when the user logs into their account. If the user prefers to have Nouse application launched manually then this launch icon can be removed from the Windows Startup menu.

(3) Nouse installation process places a shortcut Nouse Icon on the user's desktop. To start the application, the user simply double clicks on Nouse icon found on the user's desktop. Figure 3.3 shows Nouse Icon found on the user's desktop.
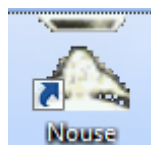
Figure 3.3 – The launch icon for Nouse application from the desktop

3.8 Calibration Mode

When the user starts Nouse application, the user is presented with a window that provides video feedback of the Webcam connected to the computer. The user should ensure the webcam is pointing towards the user and that the face of the user is in the centre of the window. Figure 3.3 provides a picture of the window the user will see at start-up.
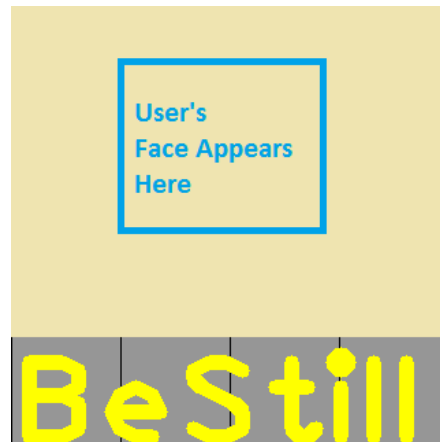

Figure 3.3 – Nouse application Initial Launch window

Nouse application needs to determine where the user's nose is located. This is called the calibration mode. The user must "Be Still" through the calibration mode as the application learns what the user's nose looks like and can then track the nose as it moves in any direction.

Once a face is found, a box is drawn around the face (see blue box of figure 3.3), and the application will zoom in to only view the user's face. The application then presents the window with a green cross hair as it learns the user's nose. The user should ensure their nose is on the crosshair (see Figure 3.4). Once the countdown reaches zero (0) NouseCursor will display the word "leave" on the bottom. The user can then move their nose and starts to navigate the mouse cursor.
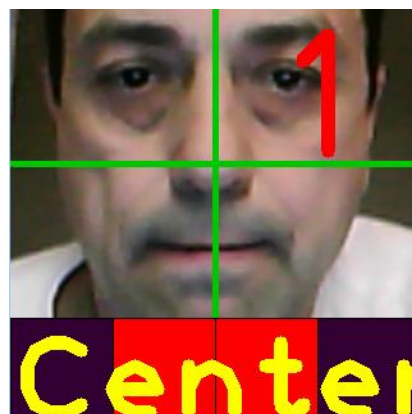

Figure 3.4 – Nouse Leaning the location of the User's Nose

The user should now be able to move Nouse cursor (see Figure 3.5) by moving their nose in the desired direction. The users should reference the User Guide and the Settings Guide to learn more about using Nouse application.

Figure 3.5 – Nouse cursor

If the user is not able to get past the calibration mode then the application is having difficulty finding the user's nose. Refer to troubleshooting chapter of the document as there may be an issue with lighting.

3.9 Uninstall Nouse Application

Nouse application allows the user to uninstall Nouse application automatically. If the user has created any custom configuration files (i.e., .nouse, .board) they should be moved to a safe location in the event that Nouse application will be re-installed.

To uninstall the application the user goes to the "Start" button (found in the bottom left hand corner of the screen), then clicking on "All Programs", then Nouse folder and finally click on the "Uninstall Nouse" icon. The user can then follow the instructions on the screen to remove the application.

Chapter 4 – Troubleshooting Nouse

The following section proves the user with resolutions to issues that may occur during the installation process or during normal use of the application.

4.1 Error Message Pops Up Saying "Could not initialize webcam."

The computer is not recognizing any webcam that is connected. Ensure that all required webcam drivers connections are properly installed. Use the webcam software to ensure the webcam is working properly.

If there are more than one webcam attached to the computer refer to the Settings Guide.

4.2 Nouse does not calibrate

There are a number of items that can cause this to happen. Review each of the following to determine if the problem is resolved:

(1) The user's entire face is not in the camera view. Adjust the webcam or the distance from the webcam to ensure the face is clearly visible. The user should only be approximately one arms length away from the webcam.

(2) Poor lighting conditions. Nouse application requires good lighting conditions in order to work optimally. Good lighting means that the face (and especially nose) is clearly visible and not over or under exposed. Adjust the lighting to ensure clear visibility of the face. For example, if the user is wearing a baseball cap, then the nose area may be shaded too much. Also, if the user wears their bifocals very low on the bridge of the nose, this may interfere with calibration.

If the user must work in an area with poor lighting conditions then the application can be configured to compensate for this. The Settings Guide provides details

(3) Too much movement by the user's head during the calibration. The user must be still during the calibration step.

In the worst case, if none of the above resolves the issue, then the user can disable the "Activate Uses Face Detection" option. This will skip the calibration step. Details of this option are described in section 1.2.11 of the Settings Guide.

4.3 Nouse Jumps or seems to be running very slowly.

There are a number of items that can cause Nouse to either jump or be perceived as running slowly. Review each of the following to determine if the problem is resolved:

(1) Ensure that there is enough RAM and CPU is available. In order to use Nouse application the computer needs to have a minimum amount of RAM and CPU speed. The user should refer to section 3.1 of this guide to ensure meeting the minimum requirements.

(2) Reduce the number of programs running. If the user's computer is close to the minimum RAM and CPU requirements then having a number of other programs running at the same time can slow down Nouse application. The user should close one or more of the other applications.

(3) Slow smooth head movements. To prevent Nouse from jumping the use must ensure their head movements are slow and smooth. Nouse does not require a lot of head movement in order to work optimally. Jerky or sporadic movements will cause Nouse cursor to jump from one part of the screen to another.

(4) Review Nouse configuration options. Nouse provides a number of configuration options that allow the user to adjust how Nouse will react to the movement of the user's nose. The user should review each one and reset any of the options that might suit their situation better.

Chapter 5 - Nouse Frequently Asked Questions

Who should use Nouse?

This technology was developed for anybody to use, however, it will be most useful for those computer users who have difficulty using their hands to use a mouse or keyboard, or for those who want to take breaks from using their hands due to fatigue/injury. It is not suitable for people with significant head tremor.

How long will it take to learn this system?

Most people can learn this technology within 1-2 sessions. If the user has experience with a joystick, it is even easier to learn.

Where can I learn more about Nouse?

Nouse application has an easy to use guide that walks users through the process of using and configuring the system. You can also visit www.Nouse.ca for more information or to find contact information.

Can I adjust the settings to suit my specific mobility needs?

Yes, Nouse has been designed to meet the individual needs of many types of users. For example, the amount and speed of neck movement required to use that Nouse can be adjusted in both the vertical and horizontal ranges. The size of Nouse cursor can be adjusted to meet visual needs. These are just two of many adjustments possible. Nouse manual goes into further detail.

Can I perform different clicks (right click, double etc.) using Nouse?

Yes. Left, right, double clicks and drag are all easily available and do not require the user to select the clicking mode from a toolbar. This is a very nice feature of Nouse. The last section of this quick guide will tell you how.

Can someone with very minimal neck range of motion use this technology?

Nouse can be used with people who have very little neck/head mobility who might have trouble using other head tracking systems.