smyle mouse

October 3, 2019



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1) Introduction

Congratulations on your installation of the Smyle Mouse!

Smyle Mouse is the next generation in head and face based hands-free control of your Windowsbased computer. It includes award-winning and patented head mouse functions, which include dwell clicking & smile clicking, as well as an adaptive switch emulator. Furthermore, all these functions are provided by means of a standard webcam that may be part of your laptop or tablet. No specialized cameras, head / sip-and-puff / bite switches, dots on the forehead, wearables or any accessories are required.

Smyle Mouse includes state-of-the-art, industry first, patented and patent-pending features that do not exist in any other commercially available products. It is also highly configurable to the user's needs. Therefore, please use this document to derive the most benefit out of using the Smyle Mouse.

2) Start up and Calibration

To get the most benefit out of using the Smyle Mouse, please note the following.

- Before you begin
 - Watch the Tutorial Videos at least once. (See link to videos <u>here</u>.) The videos are quite short and it takes less than 15 minutes to watch them all. Given that the Smyle Mouse has novel, patent pending features, time invested in becoming familiar with the new concepts can save a lot of time for the user.
 - Seating in front of the camera. Please use the following guidelines.



*Note:

If the user would like to be seated farther way than 36", increase the "Image Resolution Enhancement" setting on the Preferences tab of the Settings window.

- Calibration process
 - Be seated comfortably in the front of the web camera at about an arm's length distance (12-36 inches). When ready, click the "Calibrate and Start!" button on the "Ready to Start Smyle Mouse?" window. That will start the calibration process.
 - First, face the camera and hold your head steady for about 2-3 seconds.
 - Next, smile for about 2-3 seconds, while facing the camera. The smile should be moderately strong but not extreme. If possible, keep mouth closed while smiling.
 - Stop smiling and then open your mouth moderately, again for about 2-3 seconds.

After calibration is complete, maintain same distance from the camera (compared to the distance during the calibration), to the extent possible. Note that coming closer to the camera increases the mouse sensitivity and going farther decreases it.

3) Operating Instructions - Overview

Smyle Mouse can be used in two different modes as below. The first mode below (Head/Face Mouse mode) is the default mode, however, it can be changed to the second mode (Adaptive Switch mode) by going into the Mode tab on the Settings window.

a) Head / Face Mouse Mode

This mode allows full mouse control via head motion and facial gestures. There are two simple rules to remember when using face gestures.

Rule 1 (Pointing): Move your head to move your mouse pointer.



Rule 2 (Clicking): Smile to press a mouse button. (And stop smiling to release it.)



Therefore, by combining head motion and smiling you get a click-and-drag (aka drag), which is very similar to how it would work with a regular computer mouse. That is, if you press and release a mouse button *without moving the mouse*, you get a click. But if you press and hold the mouse button and start moving the mouse, you start a drag command which ends when you release it. Smyle Mouse works in the same way with smile combined with head motion.



Note: For convenience, Smyle Mouse does not require the user to continue holding the smile once the drag process is started. Once drag command is started, the user can release their smile and drag will continue as long as their head is still in motion. The drag command will come to an end when <u>both</u>, the smile and head motion, have come to an end.

b) Adaptive Switch Mode

This mode is for users who are looking to use Smyle Mouse only as an adaptive switch or a just a smile clicker. Here are a couple examples when Smyle Mouse can be really useful to them.

- (1) User is interested in using AAC speech generation or other software via an adaptive switch and is looking to replace their switch. This could be for various reasons. E.g.
 - Extended use of head / knee / etc. switch can cause muscular tiredness or discomfort.
 - Use of sip-and-puff or bite switch can lead to sanitary concerns as well as discomfort due to having to hold something in the mouth for extended periods of time.
 - For caregivers, setting additional switch hardware around the user's face every time they are getting ready to use it can cause unnecessary loss of time and effort.
- (2) User has good hand control and is therefore able to use a computer mouse. However, they are experiencing pain when pressing a mouse button (e.g. due to carpal tunnel syndrome). In this case, they can generate mouse clicks using their smiles in this mode.
- (3) User already has access to an eye tracker, however, is using an adaptive switch along with it to trigger various commands. They can configure Smyle Mouse to generate those commands without having to install and use additional switch hardware

Smyle Mouse's adaptive switch mode can help in each of these cases.

a) Main Window

The following sections provide an overview of the important Smyle Mouse windows that are used for interacting with and configuring Smyle Mouse.



The Main Window: shows the Camera View (for user feedback) and important buttons via the Toolbar. Note the Main Window is not required to be visible for Smyle Mouse to work, therefore it can be minimized. Following are the main elements.

- 1) **Camera View**: shows what is seen by Smyle Mouse through the webcam. Note that the lips and eyebrows are highlighted in green when things are working well. The highlights will turn red when Smyle Mouse is having trouble seeing the face clearly. Note that both the eyes and the lips need to be seen clearly for best operation.
- 2) **Hide / Show Toolbar button**: allows the user to show or hide the Toolbar below it. Hiding the toolbar is useful in allowing the Main Window to be resized to a small size.
- 3) **Toolbar**: is the horizontal area that is composed of the important buttons.

- 4) **Settings button**: allows to bring up the Settings window, which has various settings that are used to fine tune the operation of Smyle Mouse according to user preference and user condition.
- 5) **Calibrate button**: invokes the quick calibration process. It is recommended to be used every time a new person starts using Smyle Mouse. (Note that the same calibration process is automatically started every time Smyle Mouse is started.)
- 6) Click Mode buttons: decide how a click is performed. By default, the "Smile" button is selected (indicated by dark highlight). In that case, a click is performed when the user smiles. If the user selects the "Dwell" button, then every time the user hold their head steady (i.e. dwells the mouse), a click is performed. (See Click Opts window for details on causing Left versus Right versus Double clicks).
- 7) **Mouse Motion Mode buttons**: indicate when the mouse pointer will move based on head motion. By default, the "Always" mode is selected. In this case, the mouse pointer will attempt to move every time a user moves the head. In contrast, if the "With Smile" mode is selected, the mouse pointer will move only if the user also smiles at the time of moving their head. This latter mode is meant for advanced users.
- 8) Play / Pause buttons: indicate if Smyle Mouse is functioning or temporarily paused. Note that when the Pause selected both the pointing as well as clicking functions will be disabled. Therefore use of hands will be required once Smyle Mouse is paused, until "Play" is selected again.
- 9) **Exit button**: allows you to exit (completely stop) Smyle Mouse. Once stopped, use of hands will be required to restart Smyle Mouse.
- 10) **Face Detection and Smile Level indicator icons**: are displayed next to the mouse pointer to indicate if the user's face is being detected and the level of the user's smile.
 - **>** :
 - : Indicates face not found (Move to be within camera's view and turn your face towards it)



- : Indicates face found and features detected well
- : indicates face found but cannot see all of lips and/or eyes. (Turn your face towards the camera)
- : indicates level of smile detected. (This is a mini version of the Smile Meter below.)

11) **Smile Meter**: indicates the level of smile detected.

b) Click Options Window

Click Options window allows the user to choose what type of click command is generated based on a smile or dwell gesture. The below picture shows the default activations on the window.



Group 1: (Choose Left vs. Right Click)

- Based on which button in the group is activated, Smyle Mouse generates a Left or Right click upon a smile or a dwell.
- Only one button in the group can be activated at a time.
- If Right is activated, it resets to default (Left) after the click unless the lock button (at the top corner of the button) is also activated.

Group 2: (Choose Double click vs. Drag)

- Based on which one is selected, Smyle Mouse generates a double click or drag upon a smile or a dwell.
- Only one button in the group can be activated at a time.
- If a button is activated in this group, it is combined with the activation in Group 1. E.g. if buttons #2 and #3 are activated, then a smile will result in a Double-Right click.
- If any button is activated in this group, it resets to default after the smile / dwell, unless a lock button is also activated.
- **5. Reset**: resets any locked activations of buttons 1:4.

6. Pause Clicking: temporarily pauses click signals from getting generated upon any smiles/dwells. The exception is that click signals will be generated when the mouse pointer is on the click Options window itself.

c) Settings Window

Settings window provides a rich set of parameters that allow the user to configure Smyle Mouse to their needs and preferences. It has multiple tabs that organize different configurations settings.

[1] Mode Tab

This allows the user to choose whether they want to use the head mouse functions of Smyle Mouse (i.e. pointing and clicking) versus use Smyle Mouse only as an adaptive switch or a selector.

	U Settings -	- 🗆	×
	Mode Pointing Clicking Gestures Preferences		
Default Mode	Mode Pointing Clicking Gestures Preferences Smyle Mouse Mode Select appropriate mode below to choose what Smyle Mouse functions you wish to use. By default, Smyle Mouse is in "Head Mouse" mode, where all head mouse functions such as pocking are available. Choose "Adaptive Switch" mode to use Smyle Mouse only as an adaptive switch. Mouse pointin functions will not be available in this mode. Head Mouse Mode Adaptive Switch Mode Adaptive Switch Mode Image: Adaptive Switch Mode Mode Switch Mode Adaptive Switch Mode Image: Adaptive Switch Mode	pinting and	
	Close		

[2] Pointing Tab

This tab has various settings that determine how the mouse moves in accordance with the user's head motion.

9 Settings	8							_		×
Mode	Pointing	Clicking	Gestures	Preference	es					
Mous	e Sensitivity	(Speed)								
Mous	e sensitivity to	head motion in t	he X (horizontal) and Y (vertical) direction					_
X:	<u></u>	T.	i.	1	1	0	<u></u>	1	6	
Y:	L.	L.	1.	1	1		L.	J. 1	7	
Head	Tremor Filte	r								
Amou	int of filtering a	applied to head n	notion before it i	is converted to n	nouse mot	ion. Head	motions below	w this threshold	d are ignore	d
and n	ot converted in	ito mouse motion	1. Use motion							
									1	-
L.	1 1 1	1 1	1 1 1	1 1 1	1	1	1 1	I I I		-
Amou Once mous level	int of time to h dwell parked, e. A head nod of head nod or	old head steady the mouse will g or jerk is needed jerk needed to u	(dwell) before t et stuck to the c I to unstick the r unstick the mous	he mouse is dwe current location c mouse so that it se.	ell parked. on the scre can start r	en and no noving ag	ot move unless ain. See "Mou	s the user unst ise Stickiness"	icks the to set the	
E	1 I I		1 1	1 1 1	13 10	1	i i i	13 I.	500	-
Mous	e Stickiness									
Level	of effort requi	red to get a dwe	I parked mouse	(stuck to the cu	rrent locat	ion) to be	unstuck.			
Use the mous nod o	his setting to p e needs to be r jerk required	revent unintentio unstuck before it I to unstick a dwe	nal motions of t can start movin ell parked / stucl	he mouse result ng according to t k mouse.	ing from u he head m	nintention otions. Tł	al head motio his setting sets	ns. A dwell par the effort leve	rked (stuck) el of the hea	d
-	1 1 1	1. 1		I. I. I.	1 1	1	1 1 1	1 1	5	•
⊡ D	isable Mouse	Stickiness whe	en using On-So	creen <mark>Keyboa</mark> r	d					
				Close	0					

We recommend that the user try out the various pointing settings described below and adjust them as per their individual preference.

Additional Information on various settings on the Pointing tab:

- Mouse Sensitivity Adjust this such that the user is able to move the mouse end to end on the display screen with only moderate and comfortable head motion.
 - A larger setting in Y direction (with respect to the X direction) is recommended. This is because typically humans have less range of head motion in the Y direction.
- Head Tremor Filter Set this to the lowest setting the user can work with. We recommend
 a setting of 1 or 2 if the user has no tremor and has good control over their head.
 - Smaller values of this setting provide finer and smoother control over the cursor.
 Higher settings are recommended for users without sufficient head control or with head tremor.
- Dwell Park Time Recommended default is about 600 milliseconds.
 - Increase this time if the user seems to need more time to place the cursor precisely.
 Decrease this time for faster dwell parking.
 - After the user gets a feel of the dwell park mechanism, they can turn off the "Animate Dwell Park" option in Preferences tab.
- Mouse Stickiness The concept of mouse stickiness allows the user to naturally move their head without the mouse pointer leaving its parked location on the screen. This setting indicates the threshold head motion (speed) needed to make the parked mouse pointer move again. For example, to move and park the mouse pointer at the top right corner of the display screen, the user would move their head in the top right direction. Once the mouse pointer is dwell parked, however, they can move the head back to a more comfortable position. The mouse will stay in the parked location as long as the user moves their head back slowly, that is, at a speed less than the threshold defined by the Mouse Stickiness setting.
 - Default setting is 20. Lower settings allows to restart the mouse motion more easily, but make it harder to leave the mouse parked at a particular location. High settings do the reverse. We recommend the user experiment with this setting to find their sweet spot.
 - Many users prefer to not have mouse stickiness when using an on-screen keyboard. Smyle Mouse therefore disables mouse stickiness automatically when it detects that the On-Screen Keyboard (OSK) is active *and* the pointer is over the OSK window. The "Disable Mouse Stickiness when using On-Screen Keyboard" checkbox is provided to control this automatic disablement.
 - This concept provides user convenience and reduces the chances of neck strain. It can also improve user productivity by eliminating the effort required to constantly manage the location of the pointer.

[3] Clicking Tab

This tab has various settings that determine how the click signal is generated based on the user performed gesture.

Part 1: Basic Options

Settings	5								-	-		>
Mode	Pointing	Clicking	Gestures	Preferences								
Dwe	l Click Time (n	nilliseconds) –										^
Hold	head steady for	this amount of	time to cause a	dwell click.						-		
										1000	^	
Dwel	I Zone Size (pi	xels)										
Hold	head steady wit	hin an area of t	this size to cause	a dwell click.								
										20		
1	1 1 1	1 1	1 1 1			1 1	1	1	1			
Click	Options Form											
This	allows you to ch	oose the type o	of click (such as L	eft, Right, or Double	e click) that is g	generated ba	sed on y	our sm	ile or d	well ges	sture.	
It als	o allows you to	Pause or Activa	te the clicking ac	tion.								
S	Show Click Opt	ions Form										
Clic	ck Options Form	- Display Form	at									
0	All Buttons											
0	Pause / Activa	te Button Only										
0	, adde / netiva											

- Dwell Clicking is the process by which a user generates a click by holding their mouse pointer stead enough for a given amount of time. The steadiness is defined by the following settings—
 - Dwell Click Time –is the amount of time to hold the head (and therefore the mouse pointer) steady on the screen before a click will be generated.
 - Dwell Zone Size is the size of the zone / circular area within which to hold the mouse pointer for it to be considered to be "steady" or dwelling.
- Click Options form allows the user to choose which type of click should be generated based on the user's smile or dwell. E.g. Left single click, Right single click, Left Double click and so on.
 - Show Click Options form checkbox shows or hides the Click Options form. To save on desktop space, the user can choose the "Pause / Activate Button Only" if they are interested only in left single clicks.

Part 2: Advanced Options

					- 0
Mode	Pointing	Clicking	Gestures	Preferences	
[AD	VANCED OP	TIONS]	Smile		
By sm the	default, a mous iling. If the user n they get a Clic	e button gets pr keeps their hea ck-And-Drag.	ressed when the ad steady through	user starts smiling an 1 the duration of the	d the mouse button is released only when the user stops mile, then they get a Click, and if their head is moving,
Sor clic wa	me users (such k-and-drag whe iting for the smi	as users with C en a simple click le to end. This v	erebral Palsy) ma is intended. Use will help avoid an	ay not be able to hole this setting to gener y unintentional click-	their head steady during the smile, thereby causing a ite a click the very instant the user starts smiling, without ind-drags.
Not	te 1: When this ving when the u	box is checked, iser stops smilir	the mouse pointe ng.	er will freeze (stop n	oving) while the user is holding their smile. It will start
zer	e 2: This setting	g is ignored if M	louse Motion Mod	le is not set to "Alwa	s" or if either the Green and Yellow gesture timers is non-
Thi to a Lov	s helps distingu a click. Similarly ver this setting t mes that require	ish intentional s , an unintention to use only thos e clicking when t	miles from inadve al grin accompan e smiles that are the head (mouse)	ertent smiles. E.g., a ied with head motion performed when ho) is moving.	smile while talking to someone probably should not lead of a user with Cerebral Palsy should probably be ignored. ding head steady. Increase this setting if you want to play
1				· · · · ·	, , , , , , , <u>, , , ,</u> 10 -
Clic	k Assist Level				
Use as	ers need to hold a drag comman	their head stea d.	idy when smiling	to perform a click. If	their head is not steady when smiling, that is interpreted
Beg	ginner users or steadiness of the nerate a click.	users who do no eir head when s	ot have good hea miling. Choose a	d control may uninte non-zero value belo	tionally trigger a click-and-drag (instead of a click) due to v for the level of assistance needed when smiling to
ger					and fine dick-and-drage, choose a low value. Otherwise
ger If y cho	ou have good h oose a higher va	ead control and lue to avoid uni	would like the at ntended click-and	bility to perform sma I-drags.	and the cick-and-drags, choose a low value. Otherwise,
ger If y cho	ou have good h bose a higher va	ead control and lue to avoid uni	would like the at ntended click-and	oility to perform sma I-drags.	

[4] Gestures Tab

This tab has settings for an advanced user. In the default simplified experience meant for beginner users, there is no consideration given to the amount of time the user smiles and holds their head steady.

In this tab, users can define the durations for a short, medium and long smiles (and holds) (represented by the Green, Yellow and Red timers). Holding steady for different amounts of time can be used to trigger different commands such as Mouse Motion, Scroll or Drag.

ode	Pointing	Clicking	Gestures	Pre	ferences							
Jue	Fornding	Clicking	ocotareo	FIC	arenences							
[ADV	ANCED OPTI	ONS] Timers	Activated by	SMILE	Gesture							
You c	an invoke differ	ent commands	by holding your	smile fo	or different time	e durations.	When yo	u smile a	and hold,	differe	nt colo	red
timer	s are displayed	in a sequence (Green-Yellow-R	Red). The	e command co	rresponding	to a time	er can be	invoked l	oy mov	ing you	ur
neau	when that time	r is running on t	the screen.									
Red v	ig your head wr vill cause a drag	ien the timer is J.	Green will mov	e the mo	ouse, when the	e timer is Ye	llow will	cause a s	scroll, and	when	timer	IS
Note	:											
1. Tf v	- /ou ston smiling	when the Gree	n Timer is runn	ing, a Cl	ick is performe	ed.						
2 60	t the timer dura	tion below (in a	nilliseconde) to		urself more or	loce time to	invoka th	e correct	nondina c	00000	nd To	
deact	ivate a timer, si	imply set its dur	ation to zero.	give you	a sen more or	iess unie to	mvoke tr	e corres	ponding C	omina	nu. 10	
3. Ge:	sture Timers ar	e recommende	d for Advanced	Users w	ho want to get	more out o	f Smyle N	Aouse. Th	he Green	and Ye	ellow	
timer	s are set to zero	o by default, wh	nich results in Si	myle Mo	use being in a	n Easy Drag	Mode ou	t of the b	ox, where	ein Scr	oll	
Tuncti	on is not autom	atically available	e.									
>> W	/e recommend t	that beginner us	sers become mo	ore famil	liar with Smyle	Mouse bef	ore they o	change se	ettings on	this ta	ıb.	
#1. (Green -> Mou	use Motion. Cli	ick :								0	
#1. (Green -> Mou	use Motion, Cli	ick :	T.	ă î	Т	I.	ĩ	1	1	0	▲ ▼
#1. (Green -> Mou	use Motion, Cli	ick :	T	I I	ĩ	Î.	ī	1	I	0	•
#1. (#2. `	Green -> Mou Yellow -> Scro	use Motion, Cli oll :	ick :	1	1 I	1	I I	1	1	1	0	•
#1. (#2.)	Green -> Mou Yellow -> Scro	use Motion, Cli	ick :	1	i i		i č	1	1	1	0	
#1. (#2. ` #3.	Green -> Mou Yellow -> Scro Red -> Click-a	use Motion, Cli oll : ınd-Drag :	ick :	1 1	· · ·		1 1 1	1 1 1	1	1	0 0 4000	
#1. (#2. ` #3.	Green -> Mou Yellow -> Scro Red -> Click-a	use Motion, Cli oll : ind-Drag :	ick :	1 1 1	· · ·	1 1 1	1 1 1	1 1 1	1	1	0 0 4000	
#1. (#2. ` #3.	Green -> Mou Yellow -> Scro Red -> Click-a	use Motion, Cli oli : und-Drag :	ick :	1 1 1	· · ·	1	I I	i i	1	1	0 4000	
#1. (#2. ` #3.	Green -> Mou Yellow -> Scro Red -> Click-a	use Motion, Ci oll : und-Drag :	ick :	1	· · ·	1	i I	()	1	1	0 4000	
#1. (#2. ` #3.	Green -> Mou Yellow -> Scro Red -> Click-a	use Motion, Cli oll : Ind-Drag :	ick :	- 1 - 1	1 1 1 1	1	E.	1	1	1	0 4000	
#1. (#2. ` #3. I	Green -> Mou Yellow -> Scro Red -> Click-a	use Motion, Cli oli : und-Drag :	ick :	1 1	· ·		î Ç	()	1	1 1 1	0 4000	
#1. (#2. ` #3.	Green -> Mou Yellow -> Scro Red -> Click-a	use Motion, Cli oll : ind-Drag :	ick :	1	1 I	1	C C	()	1	1	0 4000	
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#1. (#2. ` #3.	Green -> Mou Yellow -> Scro Red -> Click-a	use Motion, Cli oli : und-Drag :	ick :	1 1	· ·	1	I.	1			0 4000	
#1. (#2. ` #3.	Green -> Mou Yellow -> Scro Red -> Click-a	use Motion, Cli oll : Ind-Drag :	ick :	1	1 1 1 1		I .	1 1 1			0 4000	
#1. (#2. ` #3.	Green -> Mou Yellow -> Scro Red -> Click-a	use Motion, Cli oll : und-Drag :	ick :	1 1	· · ·	1	E E	1			0 4000	

[5] Preferences Tab

This tab has user preference settings that control the audio visual feedback provided by Smyle Mouse. It also has some advanced features that relate to camera settings that have an impact on the operating distance, smoothness of operation as well as CPU time consumption.

Part 1: Basic Options

Settings						-	\times
Mode P	Pointing	Clicking	Gestures	Preferences	5		
-Visual F	eedback						^
Mouse	Motion Ani	imation					
🗹 Higł	hlight Mous	e When Mov	ving				
🗹 Anir	mate Mous	e Stickiness					
🗹 Anir	mate Dwel	Park					
Face D	etection ar	nd Expression	Feedback				
🗹 Fac	ce Detected	d Icon					
🗹 Fac	ce Not Dete	ected Icon					
Sho	ow Smile Le	vel Icon					
Sho	ow On-Scre	en Messages	(when trouble	e finding face or	lips)		
Audio E	a a dha ala						
	Motion So	unds					
	on Start of	Mouse Motio	n				
	on End of N	Marian Matian	(Dural Dark)				
		House Mouor					
Mouse	Button Sou	unds					
Click	k						
Click	k and Drag	I					
Warnin	g Sounds						

Part 2: Advanced Options

Jetting.	;						-		>
Mode	Pointing	Clicking	Gestures	Preferences					
[AD Mi	VANCED OP rror Effect Flip Image	TIONS] Car Left to Righ	nera Settings t	5					
	nage Resoluti rease this value U time consumed	to allow the us d by Smyle Mou	ment (to incr er to be farther a ise.	rease operating	distance) era. Higher values	will result in a	in increa	se in	
Im CP Fra Un sm	age Resoluti crease this value U time consumer ame Rate Use Default check this box to ioothness of poin	to allow the us d by Smyle Mou	ment (to incr er to be farther a ise. e (to conserve louse to use the wever, it may also	rease operating away from the came e CPU by lower maximum frame rat o use more CPU tim	distance) era. Higher values ing pointer sm e possible. This ca e.	will result in a	n increa	se in	~

5) Trouble Shooting

1. Smyle Mouse sometimes thinks I am smiling when I am not.

Solution:

Try one or more of the following—

- Perform a calibration and make sure to smile <u>moderately</u> when prompted during the process.
- □ Make sure you are facing the camera when working on your computer so that your lips, nose and irises of both eyes are visible to the camera without obstruction.
- □ Make sure facial features are being detected correctly and smoothly by checking the camera view displayed on the main Smyle Mouse window.
 - Correct the lighting situation such as low light or intense backlight, if required.
 - Try using a webcam that performs well in low light.

2. Smyle Mouse is not detecting my face though I can see it in the camera view displayed in the main window.

Solution:

- Try one or more of the following—
- □ Make sure you are not too far away from the camera. A rough rule of thumb is to be about an arm's length from the camera.
- □ Correct the lighting situation such as low light or intense backlight, as required.

3. Difficulty in placing the cursor precisely on a tiny area. I keep on missing the target and often overshoot or undershoot.

Solution:

- Try one or more of the following--
- Reduce Head Tremor Filter setting. This increases the granularity and smoothness of motion, allowing for finer placement.
- □ Increase Dwell Park time. This will provide your more time to fine tune the placement before the pointer dwell parks.
- Reduce Mouse Stickiness setting. This especially helps when moving mouse pointer through short distances. You can restore the setting as you become more skilled at it.
- Turn on "With Smile" Mouse Motion mode on main Smyle Mouse window. Then, keep on smiling while trying to place the pointer precisely by making small head motions. Stop smiling while holding the head steady when the pointer is at the desired location. (You may want to reduce the Dwell Park time when using the "With Smile" mouse motion mode.)

4. Difficulty with moving the mouse through large distances on the screen. The mouse is not moving far enough even though I have already turned my neck to the maximum extent.

Solution:

Try one or more of the following--

- Start the head motion at a higher than average speed (versus starting at lower than average speed). Higher head speeds move the mouse pointer through disproportionately larger distances.
- Increase the Mouse Sensitivity setting so that smaller head motion translates to large mouse motion.
- While Smyle Mouse is running, go to the Microsoft Windows' Control Panel and change Mouse settings as follows.
 - i. Turn on "Enhance Precision".
 - ii. If needed, increase "Pointer Speed".
- If you are using the "Always" Mouse Motion Mode, set the "Mouse Stickiness" setting to about 20 (or something you find comfortable). Then, to use a golf analogy, rather than trying to hit hole-in-one, make more than one attempt to get to your destination. That is, in the first attempt, move the mouse towards the destination to the maximum extent that is comfortably possible, and let it dwell park. Then pull the head back bit slowly (so that the dwell parked mouse remains in its new location) and then make another attempt to bring it closer to or at the final destination. Repeat as needed.
- If you are using "With Smile" Mouse Motion Mode, start with the head positioned in the *opposite* direction to the direction in which you would like to move the pointer. For example, if your pointer is in the middle of the screen and you would like to move it to the right edge of the screen, then point your head to the left *before* you begin smiling and moving your head towards the right. Secondly, you can also try to move the pointer to the target through multiple attempts, progressively getting closer to the target with each attempt.
- □ Try "Bouncing off the Opposite Edge" method to move the mouse pointer through large distances. For example, if the mouse pointer is near the left edge of the screen and you would like to move it all the way to the right edge of the screen, start by moving the head to get the pointer to move beyond the left edge of the screen and then pull it back to the right (a little bit faster) in one smooth head motion. This technique is especially helpful when working with large or multiple monitors.

5. Smile not resulting in click or switch command. What do I do?

Solution:

Try one or more of the following--

- Check if your face is being detected, by checking the Main Window and/or the face detection indicator icon.
 - If the face is detected make sure that facial features (lips and eyebrows) are being highlighted in green (and not red). If red --
 - Turn your head towards the camera so that both your eyes and entire lips are visible to the camera and retry.
 - Turn your head so that it is reasonably vertical.
 - Make sure there is enough light on the face and there is not strong back-lighting.
- □ Perform your smile quickly. A good rule of thumb is to start and complete the smile in about the amount of time it takes to say the word "click".
- □ Try to hold your head steady throughout your smile. That is, hold your head steady when from start to end of your smile.
 - If you get a Drag (instead of a Click) then increase the "Click Assist Level".
 That will help generate a Click instead of a Drag.
 - If you hear a beep sound when smiling (instead of a click sound), that means there is too much head motion before the smile gesture. Increase the "Max Allowable Head Motion at start of a Smile" setting in the Clicking tab and retry.
 - Note: If you plan to use Smyle Mouse to play fast action games that need clicking when the mouse (head) is moving, then look into "Activate Instant Click" below before increasing this setting too much.
- If you are in "Head Mouse Mode" and do not need to drag in one step (that is by starting your smile and simultaneously moving your head), then turn on the "Activate Instant Click" in the Clicking tab. This will make clicking much easier and regardless of presence of head motion. However, to do a Drag, you will need to use the Drag icon on the Click Options form.
 - Note that when Instant Click is activated, the mouse pointer will freeze upon a click until the time you stop smiling.
- If you are in the "Adaptive Switch Mode" and do not need to distinguish a switch button press from release (for scanning purposes), turn on "Activate Instant Switch Release" on the Mode tab. (It will be visible only when you are in the Adaptive Switch Mode.
 - Note that we recommend using this setting for users with uncontrollable head motions, e.g. certain users with Cerebral Palsy.

6. I would like to be farther away from my camera? The face highlights turn red when I do so.

Solution:

In Settings window > Preferences tab, try increasing the "Image Resolution" in steps of 50 pixels and retry. Higher the value, the farther you can be. However it also means that it can increase the CPU time consumed by Smyle Mouse.

7. How to increase the fineness or smoothness of mouse pointer motion? <u>Solution</u>:

- □ In Settings window > Pointing tab, decrease the "Head Tremor Filter" to increase the fineness of mouse pointer motion.
- In Settings window > Preferences tab, uncheck the "Use Default Frame Rate". This will allow Smyle Mouse to use as many frames as possible every second, and thereby increase the smoothness of mouse pointer motion. Note that this may increase the CPU load.

8. The display in the Main Window has become choppy. The face highlights seem shaky and seem slow to update.

Solution:

You probably have a camera with poor low light performance. Some cameras automatically (severely) decrease the frame rate when the light is low. This can lead to slow refresh of face highlights, inconsistent smile detection and choppy mouse motion. If you notice this, move to an area where the lighting condition is good so that the face is better lit.

The other option is to use a webcam with better low light performance. Note that we recommend cameras equivalent to a Logitech C270 camera or better.