

Computer Graphics Lab

Work surface height

Adjust the height of the work surface and/or the height of the chair so that the work surface allows your elbows to be bent at 90 degrees, forearms parallel with the floor, wrist straight, shoulders relaxed.

Chair

Adjust the seat tilt so that you are comfortable when you are working on the keyboard. Usually, this will be close to horizontal but some people prefer the seat tilted slightly forwards. Your knees should be bent at a comfortable angle and greater than 90 degrees flexion. If this places an uncomfortable strain on the leg muscles or if the feet do not reach the floor then a footrest should be used. The footrest height must allow your knees to be bent at 90 degrees. Therefore the height of the footrest may need to be adjustable. Adjust the backrest so that it supports the lower back when you are sitting upright.

Keyboard placement

Place the keyboard in a position that allows the forearms to be close to the horizontal and the wrists to be straight. That is, with the hand in line with the forearm. If this causes the elbows to be held far out from the side of the body then re-check the work surface height. Some people prefer to have their wrists supported on a wrist desk or the desk. Be careful not to have the wrist extended or bent in an up position.

Screen placement

Set the eye to screen distance at the distance that permits you to most easily focus on the screen. Usually this will be within an arm's length. Set the height of the monitor so that the top of the screen is below eye level and the bottom of the screen can be read without a marked inclination of the head. Usually this means that the centre of the screen will need to be near shoulder height. Eyes level with the tool bar. People who wear bifocal or multi focal lenses will need to get a balance between where they see out of their lenses and avoid too much neck flexion.

Desk-top layout

Place all controls and task materials within a comfortable reach of both hands so that there is no unnecessary twisting of any part of the body.

Posture and environment

Change posture at frequent intervals to minimize fatigue. Avoid awkward postures at the extremes of the joint range, especially the wrists. Take frequent short rest breaks rather than infrequent longer ones. Avoid sharp increases in work rate. Changes should be gradual enough to ensure that the workload does not result in excessive fatigue. After

prolonged absences from work the overall duration of periods of keyboard work should be increased gradually if conditions permit.

Lighting

Place the monitor to the side of the light source/s, not directly underneath. Try to site desks between rows of lights. If the lighting is fluorescent strip lighting, the sides of the desks should be parallel with the lights. Try not to put the screen near a window. If it is unavoidable ensure that neither the screen nor the operator faces the window.

If the monitor is well away from windows, there are no other sources of bright light and prolonged desk-work is the norm, use a low level of service light of 300 lux. If there are strongly contrasting light levels, then a moderate level of lighting of 400 - 500 lux may be desirable.

Glare and reflection

It is important to detect the presence of glare and reflection. To determine whether there is glare from overhead lights whilst seated worker should hold an object such as a book above the eyes at eyebrow level and establish whether the screen image becomes clearer in the absence of overhead glare. To detect whether there are reflections from the desk surface, the worker should hold the book above the surface and assess the change in reflected glare from the screen.

A number of ways are available to eliminate or reduce the influence of these reflections:

- Tilt the screen (top part forwards) so that the reflections are directed below eye level.
- Purchase an LCD screen.
- Cover the screen with a light diffusing surface or anti-glare screen.
- Negative contrast screen (dark characters on light background) will reduce the influence of these reflections.

If you experience eye discomfort when using a bright screen you should make the following adjustments:

- Turn the screen brightness down to a comfortable level.
- Look away into the distance in order to rest the eyes for a short while every ten minutes or so.
- Change the text and background colours. Recommended are black characters on white or yellow background, or yellow on black, white on black, white on blue and green on white. Avoid red and green and yellow on white.

Using a mouse

A well designed mouse should not cause undue pressure on the wrist and forearm muscles. A large bulky mouse may keep the wrist continuously bent at an uncomfortable angle. Pressure can be reduced by releasing the mouse at frequent intervals, by selecting a slim-line, low-profile mouse. Keep the mouse as close as possible to the keyboard, elbow bent and close to the body.

WORK HABITS

Repetitious static work (working at the computer) is very fatiguing on your upper extremities as well as your eyes. It is important that breaks from working at the computer be taken every 20 to 40 minutes in order for your body to rest and recover. Taking a short break (3 to 5 minutes) does not mean you have to stop working, other activities such as talking to a co-worker, making copies, filing, etc. could be done during breaks from typing.

It is also important to change positions periodically. Sitting in one position or leaning on your arms for an extended period of time can interfere with circulation. Good posture is essential for all users of computers. It comprises of a natural and relaxed position, providing opportunity for movement, and from which the operator can assume a number of alternative positions.

It is not the change of task *per se*, but the change to using different movements and postures that is important. The whole purpose of task variety is to give the overloaded structures a necessary break.

HELPFUL TIPS

The following tips may also help prevent musculoskeletal problems:

- Provide a 15 minute break for every two hours of continuous computer use
- Alternate work tasks
- Use a stretching routine to relax the body
- Keep the mouse at keyboard level
- Do not grip the mouse tightly
- Hold the mouse lightly
- Click gently

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