

Chapter 27

Free Assistive Technology Software for Persons with Motor Disabilities

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ABSTRACT

Free assistive technology software can be an answer to various problems of the market, most importantly the products' high cost. The focus of this chapter is on open source software and freeware available at online repositories like Raising the Floor, EmpTech, Adaptech, ATHENA, OATSoft, and Project: Possibility. The most important features and suggested information fields for each included application are presented, followed by a comparison of the repositories in the context of these features. Finally, brief descriptions and prominent examples of free AT applications are given in the following categories: augmentative and alternative communication, click helpers, content simplification, eye control, games, head control, joystick control, media players, mouse enhancers, on-screen keyboards, scanning, shortcuts and macros, stylus control, switch control, talking browsers, text entry, text readers, voice control, and word prediction.

INTRODUCTION

Conventional computer interfaces and input systems pose serious difficulties for users with motor limitations especially at the upper limbs. Furthermore, physical disabilities often affect the person's speech production, resulting in poor communication skills. Assistive Technology (AT) research has enabled the development of accessible computer input systems and communication interfaces for all motion-impaired users. AT may consist of special hardware, software or a combi-

nation of both. AT software will be the focus of this chapter that will start with an overview of the common users' needs when it comes to interacting with computers.

AT software is usually expensive, and related products are hard to find, especially for non-English speakers. Free of charge AT software partially solve the cost problem, and this will be the topic of the section that follows. Freeware, shareware, trial versions, and open source are different kinds of free of charge software that will be described in this section.

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Online repositories facilitate the search for the appropriate product, and we will dedicate several pages to them in the corresponding section of this chapter. These repositories gather and organize all the information in one place, including the installation files for AT software products. Free software often needs to be tested and reviewed by computer and AT experts in order to detect and point out functionality, reliability, installation, and compatibility issues; the results of this work, when demonstrated in an online repository raise its value. The systematic organization of applications, the consistency of the descriptive information, and its effective presentation on a web-based free AT software repository makes the search and selection of the desired products straightforward. The goal is to enable users and disability professionals to quickly find, compare and understand the operation and features of each AT software application. The most important free AT software online repositories will be presented.

AT software includes on-screen keyboards, voice recognition, head control, eye tracking, scanning, click helpers, mouse enhancements, input acceleration such as word prediction and keyboard shortcuts, Augmentative and Alternative Communication (AAC) applications, text-to-speech, and screen or document readers. All these categories will be analyzed and the most prominent examples of related free software will be mentioned in the next section.

An extensive list of 128 names and websites of currently available free applications will be given in the appendix of the chapter. Each application will be classified according to the aforementioned AT software categories (for example, on-screen keyboards), and kinds of free software (for example, open source). We will exclude inexpensive software and trial versions of commercial software. Although free AT software exists for various platforms, like Linux, MacOS, Apple apps, and Android apps, we will focus here on Microsoft Windows applications.

This chapter is a good start for someone who wants to become familiar with the terminology of AT software, explore the different kinds of free of charge applications such as freeware, shareware, trial, open source, and get an idea of what products are available in the free market.

USERS' NEEDS

Physical impairment refers to a broad range of disabilities which include orthopedic, neuromuscular, cardiovascular and pulmonary disorders. Often, people with these disabilities must rely upon assistive devices such as wheelchairs, crutches, canes, and artificial limbs in order to obtain mobility. While some people with physical disabilities have no problem to access computers, there are people with motor limitations that could face serious problem using conventional input devices. The motor limitations apply to those with difficulties in moving, controlling, or coordinating movements of the body. Motor disabilities can include weakness, limitations of muscular control such as involuntary movements, lack of coordination, or paralysis, limitations of sensation, joint problems, or missing limbs. Some physical disabilities can include pain that impedes movement. These conditions can affect the hands and arms as well as other parts of the body. Causes of such disabilities can be traumatic injuries like spinal cord injury and loss or damage of limb(s), and diseases and congenital conditions like cerebral palsy, muscular dystrophy, multiple sclerosis, spina bifida, ALS (Lou Gehrig's disease), arthritis, Parkinson's, essential tremor, etc.

The most important need of the motion disabled when it comes to computer access is to achieve the three main tasks needed to operate a typical graphical user interface environment: point, click, and type. In modern windows-based operating systems, everything is done with these three actions. The mouse is used to point, its buttons are

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