

## NAME

xtexcad – drawing utility that produces LaTeX \picture environments

## SYNOPSIS

**xtexcad** [-toolkitoption...] [-option...] [file]

## DESCRIPTION

The *xtexcad* utility is for drawing graphics which is intended to be included into a LaTeX document. For this purpose the graphics is saved as a LaTeX \picture environment.

In order to produce correct input to LaTeX, the slopes of lines and the diameters of circles are restricted to those that LaTeX supports.

## THE FILE MENU

The following commands are available under the **File** menu:

- New** Erase the current graphics completely and start a new drawing.
- Load** Load graphics from a file. This pops up a file selector and lets you choose a file. See **FILE FORMAT** on how the input file must be structured. A file which was saved by *xtexcad* can be read in again.
- Save** Save the graphics under the current file name, which is displayed in the title bar of the main window. If the graphics has not been saved in a file yet, the function is the same as **Save As**. An already existing file is backed-up by renaming it. The suffix *.old* is appended to the name of the backup file. The suffix can be changed with the resource **backupSuffix**.
- Save As** Save the current graphics under a new file name. This pops up a file selector which lets you choose a file or specify a new file name. From now on, **Save** will save the graphics to the new file name.
- Quit** Exit from *xtexcad*.

## THE EDIT MENU

The following commands are available under the **Edit** menu:

- Copy** This creates a copy of the currently selected item.
- Delete** This deletes the currently selected item.
- Edit Text** If the currently selected item is a text, a framed box text or a dashed box text, this pops up a dialog in which the text can be edited.
- Refresh** This refreshes the drawing area.

## DRAWING GRAPHICS and the DRAW MENU

The **Draw** menu allows to select the drawing mode. The currently selected mode is indicated by a check mark.

The first entry, **Pick**, switches to the pick mode. This allows that already drawn items can be selected and modified. To select an item move the pointer over it and press the left mouse button. Currently, an item can

be selected when the pointer is over its rectangular bounding box. Press the left mouse button repeatedly to cycle through the possible items for the current pointer position. (NOTE: To select a text you must carefully point at the anchor point of the text.)

When an item is selected, it can be modified by placing the pointer over the grips. To move the item, press the middle mouse button and drag the item to the desired new location. To change the size or direction of an object, press the left mouse button and drag the grip to the desired new location.

When drawing a **Line** or **Vector**, press the left mouse button to place the starting point of the line or vector. Then press the left mouse button again to place the end point. This is now the starting point of a new line. To finish the line, press the middle or right mouse button.

For a **Bezier** first place the starting point, then the end point, then the curvature of the curve using the left mouse button. Then start with the next bezier.

For the **Framed Box Text** and the **Dashed Box Text** place two opposite corners of the box. Then a popup appears where the text can be typed in and the alignment of the text within the box and the shadow style of the box can be selected. After pressing **Ok** or **Cancel**, draw the next box.

For a **Text** simply choose the location. Then a popup appears where the text can be entered and the alignment can be specified.

For a **Circle Outline** and a **Filled Circle** first specify the center, then the size.

For a **Filled Rectangle** and a **Rounded Rectangle** specify two opposite corners.

## THE OPTIONS POPUP

Pressing the **Options** button pops up a window containing several toggle buttons. With these, some features can be switched on and off (these features can also be controlled with X Resources):

### Enable Grid

displays a grid when pressed. The distance between the grid points can be specified in the text entry below in units of `\unitlength`. The initial value of this text field can be controlled with the resource `initGridDistance`. Whether the grid is initially on is controlled by the resource `initGrid`.

### Snap to Grid

When this option is enabled and the option **Enable Grid** is also selected, only restricted positions in the drawing area can be selected (only the grid points). See also the resource `initGrid`.

### Unlimited Slopes and Unlimited Diameters

When these options are switched on, unlimited slopes for lines and vectors and unlimited diameters for discs and circles are allowed. Note, that output files produced with these options enabled will not be accepted by plain LaTeX. Normally, circles, discs, lines and vectors are precisely restricted to those available with usual LaTeX fonts. See also the resources `initUnlimitedSlopes` and `initUnlimitedCircles`.

**Ruler** switches on a ruler along the top and left edges of the drawing area with labels in multiples of `\unitlength`. See also the resource `initRuler`.

### Cross Hair

switches on a cross hair which follows the pointer. See also the resource `initCross`.

### Minimum Length

When this option is enabled, *xtexcad* obeys that a minimum length is required for slanted lines and vectors. The corresponding resource is `initUnlimitedLengths`.

## THE SHIFT POPUP

When the **Shift** button is pressed, a window pops up with which the drawing can be shifted in the drawing area. There are 4 buttons with arrows for the 4 directions and a small button between them which centers the drawing. The amount how far to shift the drawing can be specified in the text entry field below the arrow buttons. The initial value in this field can be controlled by the resource **initOffset** where the value is understood in units of `\unitlength`.

## THE ZOOM POPUP

When the **Zoom** button is pressed, a window pops up where the current zoom factor (as a percent value) can be specified. The factor is limited to the range 25 through 400. The initial zoom value can be controlled by the resource **initZoomFactor**. The button shows the current zoom factor. (The center button of the **Shift** popup is useful to place the drawing in the middle of the drawing area again.)

## OPTIONS and X RESOURCES

This program uses the X Toolkit and Athena widgets. The class name for the application is **XTeXcad**. It understands all of the core resource names and classes and all of the standard X Toolkit command line options. The following standard X Toolkit command line arguments are commonly used with *xtexcad*:

**-fn** *font*

This option specifies the font to be used for displaying text in buttons and menu entries as well as the text in the drawing area. The font used in the drawing area can selectively be chosen with the application resource **.font** (class **.Font**).

**-fg** *color*, **-bg** *color*

This specifies the foreground and background colors of all of *xtexcad*s windows. The foreground color of the drawing area can selectively be chosen with the application resource **.foreground** (class **.Foreground**).

**-geometry** *geometry*

This option specifies the preferred size and position of the application window.

**-display** *host:display*

This option specifies the X server to contact.

In addition, the following application specific resources can be used to customize *xtexcad*:

**.initOffset**, class **.InitOffset**

specifies the initial value by which the image is shifted by the buttons in the **Shift** popup. Default is *10.0*.

**.initZoomFactor**, class **.InitZoomFactor**

specifies the initial zoom factor. This value is restricted to the range 25 to 400. Default is *100*.

**.initGridDistance**, class **.InitGridDistance**

specifies the initial distance of the grid points. Default is *10.0*.

**.rulerFont**, class **.Font**

This resource specifies the font which will be used to draw the units on the ruler if it is displayed.

**.defaultUnitLength**, class **.DefaultUnitLength**

This specifies the default TeX dimension for the `\unitlength` of the saved picture. The value must be a floating point number, followed by one of the two-letter units of dimension as understood by TeX (regardless of the case): **pt**, **cm**, **mm**, **pc**, **in**, **bp**, **dd**, **cc**, **sp**, **em** (font-relative unit, roughly 10pt). It is highly recommended to choose sensible multiples of **pt** as default (for example 10pt).

2pt, or 0.5em) because all units are internally translated to **pt** and 1pt corresponds approximately to 1 screen pixel at zoom 100 (see also the **BUGS** section). Default is *1.0pt*.

**.backupSuffix**, class **.BackupSuffix**

This string is appended to the name of backup files. Default is *.old*.

**\*filter**, class **\*Filter**

This resource gives the initial value for the file filter in the file selector widget used by the **Load**, **Save** and **Save As** commands. Default is *\**.

**.initSnapGrid**, class **.InitSnapGrid**

This resource specifies whether only selected points on the grid can be chosen. Default is *off*.

**.initRuler**, class **.InitRuler**

This resource specifies whether the ruler is initially drawn. Default is *off*.

**.initGrid**, class **.InitRuler**

This resource specifies whether the grid is initially drawn. Default is *off*.

**.initCross**, class **.InitRuler**

This resource specifies whether the cross is initially drawn. Default is *off*.

**.initUnlimitedSlopes**, class **.InitUnlimited**

This resource specifies whether lines and vectors with arbitrary slopes can be drawn. Default is *false*.

**.initUnlimitedCircles**, class **.InitUnlimited**

This resource specifies whether circles with arbitrary diameters can be drawn. Default is *false*.

**.initUnlimitedLengths**, class **.InitUnlimited**

This resource specifies whether very short lines and vectors can be drawn. Default is *false*.

## FILE FORMAT

*xtexcad* can read not only files saved by itself but also by other means, for example hand written files. For a file to be understood by *xtexcad* it must contain the following: Optionally, a **\unitlength=TeX dimension** command, a **\begin{picture}** phrase (without white space after **\begin**) with or without the optional argument, zero or more **\put**, **\qbezier**, or **\bezier** commands, and an **\end{picture}** phrase (without white space after **\end**). Everything before **\begin{picture}** (except **\unitlength**) and after **\end{picture}** is ignored. The **\qbezier** command can come with or without the optional argument. Its value, however, is ignored and will not be written to the file any more when the file is saved.

A file created by *xtexcad* always assigns a value to **\unitlength**. The whole file is inside a group (curly braces) so that this assignment is local. For a newly created file, the value of **\unitlength** will be taken from the resource **defaultUnitLength** whose default is 1.0pt. If a file is loaded in, which assigns a value to **\unitlength**, this value will be preserved. This means that if you find that the picture is too large or too small for the LaTeX document, you can manually scale it by editing the **\unitlength** in the resulting file. If you later edit the file with *xtexcad*, it will not destroy this change, and the picture will appear scaled accordingly in the drawing area of *xtexcad*, since 1pt corresponds to 1 screen pixel (at zoom 100).

## SEE ALSO

Leslie Lamport: *LaTeX: A Document Preparation System*, Goossens *et al.*: *The LaTeX companion*.

## BUGS

Modifying objects lacks some features like cross hair. It is also very unfriendly with servers that do not support backingstore. The grips should be transparent.

The shadow style is currently ignored.

Some aspects (the shadow-part of the text placement popup) may not work when linked with X11R4 libraries because the Toggle widget changed its behavior from R4 to R5.

The optional argument of the `\qbezier` command is ignored and does not get saved to the file when a picture is loaded and saved later.

Redrawing after modifying an item is worse than bad.

Internally, all units are translated to TeX points (pt), and 1 screen pixel (at zoom 100) is taken to be approximately 1pt. However, this may result in rounding and positioning errors if `\unitlength` is not a proper multiple of 1pt.

Sometimes, especially when drawing very short lines, it is possible to produce unsupported LaTeX-slopes of lines and vectors. Working with a large zoom factor helps. Also, for some `\unitlengths` the minimum line length computed is too short.

## COPYRIGHT

Copyright 1991 by Klaus Zitzmann, 1993-1996 by Johannes Sixt. The file selection widget is copyrighted by J.K.Wight <J.K.Wight@newcastle.ac.uk> which itself uses code written by Byron Rakitzis <byron@netapp.com> (the regexp package).

## AUTHORS

Klaus Zitzmann <zitzmann@infko.uni-koblenz.de> wrote TeXcad 1.2.

Johannes Sixt <Johannes.Sixt@telecom.at> rewrote much of that version and produced this version of XTeXcad. Most of the changes from 2.3 to 2.4 are due to Notker Amann <amann@isr.uni-stuttgart.de>.