

This document presents a complete list of the 1000+ functions defined in Impromptu v1.4.

Help on any of the functions defined in this document can be found by calling the `impromptu help` function. e.g. (`help au:asys:get-fft-array`). An optional boolean argument provides more detailed help if available e.g. (`help au:asys:get-fft-array #t`). Help information is printed directly to the Impromptu log view.

## AUDIO FUNCTIONS

`au:asys:get-fft-array`  
`au:asys:get-fft-data`  
`au:asys:get-frequency-array`  
`au:asys:get-frequency-data`  
`au:clear-graph`  
`au:connect-node`  
`au:connect-node-async`  
`au:disconnect-node`  
`au:enveloped-change`  
`au:get-audio-data-from-movie`  
`au:get-bypass`  
`au:get-device-input-channels`  
`au:get-device-output-channels`  
`au:get-node-strings`  
`au:get-node-vector`  
`au:get-number-input-busses`  
`au:get-number-output-busses`  
`au:get-param`  
`au:get-param-ids`  
`au:get-param-info`  
`au:get-property`  
`au:get-property-info`  
`au:get-sample-markers`  
`au:has-custom-ui`  
`au:init-audiofile-player`  
`au:linear-change`  
`au:load-audio-data`  
`au:load-preset`  
`au:make-node`  
`au:midi-out`  
`au:open-view`  
`au:play-note`  
`au:play-sound`  
`au:play:set-sample-data`  
`au:print-audiounits`  
`au:print-graph`  
`au:print-params`  
`au:recd:get-sample-data`  
`au:render-callback`  
`au:reset-audiounit`  
`au:save-preset`  
`au:schedule-sound`  
`au:set-bypass`  
`au:set-global-beat`  
`au:set-global-tempo`  
`au:set-global-time`  
`au:set-param`

`au:set-property`  
`au:set-speech-vol`  
`au:speak`  
`au:start-audio-capture`  
`au:start-graph`  
`au:start-note`  
`au:start-sound`  
`au:start-visual-ui`  
`au:stop-audio-capture`  
`au:stop-graph`  
`au:stop-note`  
`au:stop-sound`  
`au:stop-visual-ui`  
`au:sysex`  
`au:update-graph`

`getp`  
`make-metro`  
`play`  
`play-note`  
`play-sound`  
`setp`  
`setpn`  
`start-note`  
`start-sound`  
`stop-note`  
`stop-sound`

## GRAPHICS FUNCTIONS

`gfx:add-arc`  
`gfx:add-curve`  
`gfx:add-glyphs`  
`gfx:add-line`  
`gfx:add-oval`  
`gfx:add-path`  
`gfx:add-text`  
`gfx:apply-filter`  
`gfx:cache-movie`  
`gfx:cache-movie-ci`  
`gfx:canvas-key-down`  
`gfx:canvas-key-up`  
`gfx:capture-canvas`  
`gfx:capture-image`  
`gfx:clear-canvas`  
`gfx:clear-image`  
`gfx:close-canvas`  
`gfx:close-path`

`gfx:convert-image`  
`gfx:copy-image`  
`gfx:debug-graphics`  
`gfx:destroy-movie`  
`gfx:draw-group`  
`gfx:draw-image`  
`gfx:draw-path`  
`gfx:draw-text`  
`gfx:filter-image`  
`gfx:flip-image`  
`gfx:get-cached-frame`  
`gfx:get-canvas-bounds`  
`gfx:get-canvas-size`  
`gfx:get-code-image`  
`gfx:get-filter-param`  
`gfx:get-ichat-dimensions`  
`gfx:get-image-data`  
`gfx:get-image-from-canvas`  
`gfx:get-image-from-nsview`  
`gfx:get-image-from-screen`  
`gfx:get-image-from-window`  
`gfx:get-image-pixels`  
`gfx:get-image-size`  
`gfx:get-live-frame`  
`gfx:get-movie-duration`  
`gfx:get-movie-fps`  
`gfx:get-movie-frame`  
`gfx:get-nsview-from-nswindow-with-title`  
`gfx:get-nswindow-with-title`  
`gfx:get-offscreen`  
`gfx:get-path-bounds`  
`gfx:get-path-centre`  
`gfx:get-path-point`  
`gfx:get-window-bounds`  
`gfx:get-window-size`  
`gfx:group2image`  
`gfx:hide-menu`  
`gfx:image2image`  
`gfx:load-image`  
`gfx:load-movie`  
`gfx:load-texture`  
`gfx:lock-canvas-size`  
`gfx:make-canvas`  
`gfx:make-circle`  
`gfx:make-curve`  
`gfx:make-filter`  
`gfx:make-image`  
`gfx:make-line`  
`gfx:make-movie-cache`

gfx:make-movie-cache-ci	gl:blend-color	gl:is-buffer
gfx:make-oval	gl:blend-equation	gl:light
gfx:make-path	gl:blend-func	gl:light-model
gfx:make-rectangle	gl:buffer-data	gl:line-width
gfx:make-square	gl:buffer-sub-data	gl:link-program
gfx:make-text	gl:call-list	gl:load-identity
gfx:make-text-style	gl:clear	gl:load-matrix
gfx:make-text-with-glyphs	gl:clear-accum	gl:load-transpose-matrix
gfx:move-group	gl:clear-color	gl:make-opengl
gfx:move-path	gl:close-opengl	gl:map-1
gfx:move-path-sync	gl:color	gl:map-2
gfx:open-canvas	gl:color-material	gl:map-buffer
gfx:open-video-preferences	gl:color-pointer	gl:map-grid-1
gfx:path2image	gl:compile-shader	gl:map-grid-2
gfx:paths-intersect?	gl:copy-pixels	gl:material
gfx:point-in-path?	gl:create-program	gl:matrix-mode
gfx:print-filter-params	gl:create-shader	gl:mult-matrix
gfx:print-filters	gl:delete-buffer	gl:mult-transpose-matrix
gfx:print-video-devices	gl:delete-program	gl:multi-draw-elements
gfx:rect-of-drawn-text	gl:delete-shader	gl:new-list
gfx:refresh-canvas	gl:depth-mask	gl:normal-pointer
gfx:rotate-path	gl:depth-range	gl:open-opengl
gfx:scale-path	gl:detach-shader	gl:ortho
gfx:scale-path-sync	gl:disable	gl:pixel-store
gfx:set-alias	gl:disable-client-state	gl:pixel-transfer
gfx:set-canvas-size	gl:draw-arrays	gl:pixel-zoom
gfx:set-display-resolution	gl:draw-ciimage	gl:point-size
gfx:set-filter-param	gl:draw-elements	gl:polygon-mode
gfx:set-filter-param-now	gl:draw-pixels	gl:pop-matrix
gfx:set-ichat-view	gl:edge-flag-pointer	gl:program-parameter-ext
gfx:set-image-pixels	gl:enable	gl:push-matrix
gfx:set-start-point	gl:enable-client-state	gl:raster-pos
gfx:set-video-bounds	gl:end	gl:read-pixels
gfx:set-video-device	gl:end-list	gl:rotate
gfx:set-video-device-input	gl:eval-coord-1	gl:scale
gfx:show-menu	gl:eval-coord-2	gl:secondary-color-pointer
gfx:size-of-drawn-text	gl:eval-mesh-1	gl:shade-model
gfx:start-live-video	gl:eval-mesh-2	gl:shader-source
gfx:start-movie-capture	gl:flush	gl:tex-coord-2d
gfx:start-pdf-capture	gl:fog	gl:tex-coord-pointer
gfx:stop-movie-capture	gl:fog-coord-pointer	gl:tex-env
gfx:stop-pdf-capture	gl:frustum	gl:tex-image-2d
gfx:text2image	gl:gen-buffer	gl:tex-parameter
gfx:vdsp	gl:gen-lists	gl:translate
gfx:veclib	gl:gen-textures	gl:uniform
gfx:vimage	gl:get-attrib-location	gl:unmap-buffer
gfx:vimagef	gl:get-boolean	gl:update-backing-image
gfx>window-to-front	gl:get-double	gl:use-program
gfx:worker-set-filter-param	gl:get-error	gl:vertex
	gl:get-float	gl:vertex-attrib
	gl:get-image-from-opengl	gl:vertex-pointer
	gl:get-int	gl:viewport
	gl:get-program-info-log	gl>window-pos
	gl:get-shader-info-log	glu:error-string
	gl:get-uniform-location	glu:look-at
	gl:get-window-bounds	glu:perspective
	gl:get-window-size	glut:solid-cube
	gl:hint	glut:solid-sphere
	gl:index-pointer	glut:solid-teapot
	gl:interleaved-arrays	glut:swap-buffers

## OPENGL FUNCTIONS

gl:accum  
gl:array-element  
gl:attach-shader  
gl:begin  
gl:bind-buffer  
gl:bind-texture

glut:wire-cube  
glut:wire-sphere  
glut:wire-teapot

## SYSTEM FUNCTIONS

sys:clear-log-view  
sys:clear-scheduler  
sys:dump-stack  
sys:get-documentation-  
dictionary  
sys:get-keywords  
sys:get-scheme-editor  
sys:get-scheme-str-buffer  
sys:get-screen-size  
sys:get-string-from-message-bar  
sys:get-text-buffer  
sys:help-entries  
sys:impromptu-help  
sys:ipc-call  
sys:ipc-connect-to-process  
sys:ipc-define  
sys:ipc-eval-string  
sys:ipc-load  
sys:ipc-new-process  
sys:remove-block  
sys:run-applescript  
sys:run-gc  
sys:scheme-eval-timer  
sys:set-block  
sys:set-pasteboard  
sys:set-text-buffer  
sys:task-queue-logging  
sys:vector-recycle  
sys:verbose-error-logging  
sys:write-log-view

pb-loop1  
pb-loop4  
pb:cb  
pb:cb-list

call-cpp  
call-cpp-at-time

help

## OBJC BRIDGE FUNCTIONS

objc:action  
objc:add-object  
objc:call  
objc:cicolor->list  
objc:civector->vector  
objc:data-to-image  
objc:data:char->float

objc:data:double->float  
objc:data:double->sint64  
objc:data:double->uint64  
objc:data:float->char  
objc:data:float->double  
objc:data:float->sint32  
objc:data:float->uint32  
objc:data:float->uint8  
objc:data:get-char  
objc:data:get-double  
objc:data:get-float  
objc:data:get-sint32  
objc:data:get-sint64  
objc:data:get-uint16  
objc:data:get-uint32  
objc:data:get-uint64  
objc:data:get-uint8  
objc:data:make  
objc:data:set-char  
objc:data:set-double  
objc:data:set-float  
objc:data:set-sint32  
objc:data:set-sint64  
objc:data:set-uint16  
objc:data:set-uint32  
objc:data:set-uint64  
objc:data:set-uint8  
objc:data:sint32->float  
objc:data:subref  
objc:data:uint32->float  
objc:data:uint8->float  
objc:destroy  
objc:from-address  
objc:gc  
objc:get-address  
objc:get-value-for-key  
objc:image-to-data  
objc:iskind?  
objc:list->cicolor  
objc:list->nsarray  
objc:list->nsdictionary  
objc:make  
objc:make-date  
objc:make-number  
objc:nsarray->list  
objc:nsdata->vector  
objc:nsdictionary->list  
objc:nsnumber->number  
objc:nsstring->string  
objc:null?  
objc:number->nsnumber  
objc:objc->string  
objc:object-at-index  
objc:print  
objc:remove-object  
objc:set-value-for-key  
objc:string->nsdata  
objc:string->nsstring  
objc:string:with-format  
objc:vector->civector

objc:vector->nsdata-float  
objc:vector->nsdata-int  
objc:vector->nsdata-uint8

## IO FUNCTIONS

io:alt-key-down  
io:alt-key-up  
io:binary-and  
io:binary-or  
io:caps-key-down  
io:caps-key-up  
io:cwd  
io:delete-file  
io:deregister-mouse-events  
io:directory-list  
io:file-exists?  
io:get-mouse-position  
io:log  
io:make-directory  
io:midi-destination  
io:midi-in  
io:midi-out  
io:midi-source  
io:midi-sysex-out  
io:mouse-down  
io:mouse-drag  
io:mouse-dropped  
io:mouse-up  
io:move-file  
io:osc-register-events  
io:osc-send  
io:print-midi-destinations  
io:print-midi-devices  
io:print-midi-id  
io:print-midi-sources  
io:read-midi-file  
io:register-mouse-events  
io:right-mouse-down  
io:right-mouse-drag  
io:right-mouse-up  
io:send-port-message  
io:set-caps-through  
io:validate-filename

## COMMON LISP LIB FUNCTIONS

cl:adjoin  
cl:and?  
cl:atom?  
cl:butlast  
cl:butnthcdr  
cl:copy-list  
cl:delete  
cl:delete-if  
cl:delete-if-not

cl:every  
cl:find-if  
cl:has-duplicates?  
cl:intersection  
cl:last  
cl:list\*  
cl:list-of??  
cl:make-list  
cl:member-if  
cl:merge  
cl:merge!  
cl:nconc  
cl:notany  
cl:notevery  
cl:nreverse  
cl:nthcdr  
cl:or?  
cl:position  
cl:reduce  
cl:reduce-init  
cl:remove  
cl:remove-duplicates  
cl:remove-if  
cl:remove-if-not  
cl:set-difference  
cl:some  
cl:sort  
cl:sort!  
cl:sorted?  
cl:subset?  
cl:union

## HYGENIC MACRO FUNCTIONS

hyg:flatten  
hyg:rassq  
hyg:tag  
hyg:untag  
hyg:untag-do  
hyg:untag-lambda  
hyg:untag-let  
hyg:untag-let\*  
hyg:untag-letrec  
hyg:untag-list  
hyg:untag-list\*  
hyg:untag-named-let  
hyg:untag-no-tags  
hyg:untag-quasiquote  
hyg:untag-vanilla

## VECTOR MATH FUNCTIONS

math:matrix\*  
math:mean  
math:std-deviation  
math:variance  
math:vector%

math:vector\*  
math:vector+  
math:vector-  
math:vector-max  
math:vector-min  
math:vector-rand  
math:vector-rotate  
math:vector-sum  
math:vector-sum-and-rotate  
math:vector-sum-and-rotate-i  
math:vector/  
math:vector<  
math:vector<=  
math:vector=  
math:vector==  
math:vector>  
math:vector>=  
math:vector@  
math:vector^

## VDSP FUNCTIONS

vdsp:blkman\_window  
vdsp:blkman\_windowd  
vdsp:conv  
vdsp:convd  
vdsp:dotpr  
vdsp:dotprd  
vdsp:f3x3  
vdsp:f3x3d  
vdsp:f5x5  
vdsp:f5x5d  
vdsp:hamm\_window  
vdsp:hann\_window  
vdsp:hann\_windowd  
vdsp:imgfir  
vdsp:imgfird  
vdsp:maxmgv  
vdsp:maxmgvd  
vdsp:maxv  
vdsp:maxvd  
vdsp:meamgv  
vdsp:meamgvd  
vdsp:meanv  
vdsp:meanvd  
vdsp:minmgv  
vdsp:minmgvd  
vdsp:minv  
vdsp:minvd  
vdsp:mmul  
vdsp:mmuld  
vdsp:mtrans  
vdsp:mtransd  
vdsp:nzcros  
vdsp:nzcrosd  
vdsp:sve  
vdsp:sved  
vdsp:svemg

vdsp:svemgd  
vdsp:svesq  
vdsp:svesqd  
vdsp:vabs  
vdsp:vabsd  
vdsp:vabsi  
vdsp:vadd  
vdsp:vaddd  
vdsp:vclipc  
vdsp:vdist  
vdsp:vdistd  
vdsp:vdiv  
vdsp:vdivd  
vdsp:vdpsp  
vdsp:vfill  
vdsp:vfilld  
vdsp:vfilli  
vdsp:vfrac  
vdsp:vfracd  
vdsp:vgathr  
vdsp:vgathrd  
vdsp:vgen  
vdsp:vgend  
vdsp:vindex  
vdsp:vindexd  
vdsp:vintb  
vdsp:vintbd  
vdsp:vlint  
vdsp:vlintd  
vdsp:vmax  
vdsp:vmaxd  
vdsp:vmaxmg  
vdsp:vmaxmgd  
vdsp:vmin  
vdsp:vmind  
vdsp:vminmg  
vdsp:vminmgd  
vdsp:vmul  
vdsp:vmuld  
vdsp:vpoly  
vdsp:vpolyd  
vdsp:vramp  
vdsp:vrampd  
vdsp:vrand  
vdsp:vrandd  
vdsp:vrsun  
vdsp:vrsumd  
vdsp:vrhrs  
vdsp:vrhrs  
vdsp:vsadd  
vdsp:vsaddd  
vdsp:vsaddi  
vdsp:vsdiv  
vdsp:vsdivd  
vdsp:vsdivi  
vdsp:vsml  
vdsp:vsml  
vdsp:vsort  
vdsp:vsortd  
vdsp:vspdp

vdsp:vsub  
vdsp:vsubd  
vdsp:vtmerg  
vdsp:vtmergd  
vdspp:hamm-windowd

## VECLIB FUNCTIONS

veclib:ceil  
veclib:ceilf  
veclib:floor  
veclib:floorf  
veclib:sqrt  
veclib:sqrtf  
veclib:vvceil  
veclib:vvceilf  
veclib:vvcos  
veclib:vvcosf  
veclib:vvcoshf  
veclib:vvexp  
veclib:vvexpf  
veclib:vvfloor  
veclib:vvfloorf  
veclib:vvlog  
veclib:vvlog10  
veclib:vvlog10f  
veclib:vvlogf  
veclib:vvpow  
veclib:vvpowf  
veclib:vvrec  
veclib:vvrecf  
veclib:vvsin  
veclib:vvsinf  
veclib:vvsinh  
veclib:vvsinhf  
veclib:vvsqrt  
veclib:vvsqrtf  
veclib:vvatan  
veclib:vvatanf  
veclib:vvatanh  
veclib:vvatanhf

## VIMAGE FUNCTIONS

vimage:affine-warp  
vimage:box-convolve  
vimage:clip-to-alpha  
vimage:contrast-stretch  
vimage:convolve  
vimage:convolve-with-bias  
vimage:dilate  
vimage:equalization  
vimage:erode  
vimage:histogram-calculation

vimage:histogram-specification  
vimage:horizontal-reflect  
vimage:matrix-multiply  
vimage:max  
vimage:min  
vimage:premultiply-data  
vimage:rotate  
vimage:scale  
vimage:unpremutiply-data  
vimage:vertical-reflect  
vimagef:affine-warp  
vimagef:clip-to-alpha  
vimagef:contrast-stretch  
vimagef:convolve  
vimagef:convolve-multi-kernel  
vimagef:convolve-with-bias  
vimagef:dilate  
vimagef:equalization  
vimagef:erode  
vimagef:histogram-calculation  
vimagef:histogram-specification  
vimagef:horizontal-reflect  
vimagef:matrix-multiply  
vimagef:max  
vimagef:min  
vimagef:premultiply-data  
vimagef:rotate  
vimagef:scale  
vimagef:unpremutiply-data  
vimagef:vertical-reflect

## GENERAL FUNCTIONS

\*  
+  
-  
/  
<  
<=  
<>  
=  
>  
>=  
abs  
acons  
acos  
and  
anyatom->string  
append  
apply  
asin  
assoc  
assq  
assv  
atan  
atom->string  
atom?  
begin

boolean?  
caaaar  
caaadr  
caaar  
caadar  
caaddr  
caadr  
caar  
cadaar  
cadadr  
cadar  
caddar  
cadddr  
caddr  
cadr  
call-with-current-continuation  
call-with-input-file  
call-with-output-file  
call/cc  
car  
case  
catch  
cdaaar  
cdaadr  
cdaar  
cdadar  
cdaddr  
cdadr  
cdar  
cddaar  
cddadr  
cddar  
cdddar  
cddddr  
cdddr  
cddr  
cdr  
ceiling  
change-over-time  
char->integer  
char-alphabetic?  
char-ci-cmp?  
char-ci-cmp=?  
char-ci-<?  
char-ci=?  
char-ci=?  
char-ci=?  
char-ci=?  
char-cmp?  
char-downcase  
char-lower-case?  
char-numeric?  
char-ready?  
char-upcase  
char-upper-case?  
char-whitespace?  
char<=?  
char<?  
char=?  
char>=?  
char>?

char?	get-named-arg	oblist
close-input-port	head	odd?
close-output-port	if	open-input-file
close-port	inexact->exact	open-input-output-file
closure?	inexact?	open-input-output-string
code-gen	input-output-port?	open-input-string
complex?	input-port?	open-output-file
cond	integer->char	open-output-string
cond-eval	integer->real	or
cond-eval-and	integer?	output-port?
cond-eval-or	interaction-environment	pair?
cond-expand	keys	peek-char
cond-expand-runtime	lambda	pop-handler
cons	last-pair	port?
cons-stream	lcm	positive?
cos	length	pred
cosr	let	print
cptr?	let*	print-error
current-environment	letrec	print-full
current-input-port	list	print-notification
current-output-port	list*	procedure?
define	list->string	push-handler
define-macro	list->vector	put
define-syntax	list-ref	quasiquote
define-with-return	list-tail	quit
defined?	list?	quote
delay	load	quotient
display	log	random
do	macro	random-envelope
dotill	macro-expand	random-gaussian
dotimes	macro?	random-int
envelope-segments-l	make-closure	random-next
envelope-segments-v	make-envelope	random-real
environment?	make-envelope-l	rational->real
eof-object?	make-envelope-v	rational?
eq?	make-environment	read
equal?	make-list	read-char
eqv?	make-list-with-proc	real->integer
error	make-string	real->rational
eval	make-vector	real?
eval-polymorphic	make-vector-with-proc	remainder
even?	map	remove-first
exact->inexact	mappend	replace-all
exact?	max	replace-first
exp	mcons	reverse
expt	member	round
floor	memq	set!
fmod	memv	set-car!
foldr	min	set-cdr!
foo	modulo	set-input-port
for-each	more-handlers?	set-obj-for-key!
force	negative?	set-output-port
gc	new-segment	sexpr->string
gc-verbose	newline	sin
gcd	not	sinr
generic-assoc	now	sqrt
generic-member	null?	string
gensym	number->string	string->anyatom
get	number?	string->atom
get-closure-code	objc?	string->cptr

string->list  
string->number  
string->sexpr  
string->symbol  
string-append  
string-ci<=?  
string-ci<?  
string-ci=?  
string-ci>=?  
string-ci>?  
string-cmp?  
string-copy  
string-fill!  
string-length  
string-ref  
string-set!  
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string<?  
string=?  
string>=?  
string>?  
string?  
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succ  
symbol->string  
symbol?  
tail  
tan  
tanr  
throw  
tracing  
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vector->list  
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vector-fill!  
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zero?