Appendix A

Glossary of Terms and Abbreviations

basis fringe
an elemental fringe pattern computed to diffract light in a specific manner. Linear summations of basis fringes are used as holographic patterns. The name “basis fringe” is an analogy to mathematical basis functions.

CM2
Connection Machine Model 2, massively parallel supercomputer manufactured by Thinking Machines, Inc. of Cambridge, MA USA.

CGH
computer generated hologram, specifically, the set of computed fringe patterns in digital form.

Cheops
a digital image processing platform originally designed to explore scalable digital TV and real-time image encoding and decoding for the TVOT Consortium at the MIT Media Laboratory.

diffraction-specific computation
the new method of holographic fringe computation described, implemented, and analyzed in this dissertation.

diffraction table
a table used to map the location and brightness of an image element to a sequence of hogel-vector component contributions.

DSP
digital signal processing.

fringe
the holographic pattern that is either recorded optically or generated computationally and used to diffract light to form an image.

HPO
horizontal parallax only. A 3-D imaging system, e.g., a holographic one, that provides motion parallax in the horizontal viewing-zone direction but not in the vertical direction.

HVS
human visual system.

hogel
holographic element; a piece of hologram that has homogeneous diffraction properties and is small enough to appear as a single point to the viewer.

hololine
a line of a holographic pattern.

holoplane
the plane containing the fringe pattern during recording, reconstruction, or computation.

holovideo
a 3-D holographic electronic display system that impresses a holographic fringe pattern upon a beam of light, causing the light to diffract and form a 3-D image. [from Greek *holos* whole + Latin *videre* to see]

hogel vector
a compact set of weights specifying the diffractive purpose of a hogel.

image-plane hologram
a hologram that is located amid the image that it reconstructs.

image volume
the volume occupied by a 3-D image.

K-
1024. The suffix K- is used to signify 1024 items, e.g., 1 Ksamples = 1024 samples, 1 KB = 1024 bytes.

M-
1048576. The suffix M- is used to signify 1024*1024 items, e.g., 1 Msamples = 1048576 samples, 1 MB = 1048576 bytes.

MAC
multiplication accumulation; a numerical calculation consisting of one multiplication and one addition.

parallax resolution
the number of distinguishably different views that the HVS can see in a given image.

SCSI
small computer standard interface; a somewhat low-bandwidth interface for computers and their peripherals.

SLM
spatial light modulator; a device which modulates a beam of light.

SNR
signal-to-noise ratio.

viewer-plane hologram
a hologram that coincides with its viewing zone, i.e., a hologram designed to be located at the eyes of the viewer.

viewer stimulus
that which is seen by the viewer, i.e., the qualities of a displayed image, as perceived by the viewer.

VRAM
video random-access memory: fast read-write (generally) dual-ported digital memory used in framebuffers.

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