

Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science
6.111 - Introductory Digital Systems Laboratory

Project Suggestions

In past years, a great variety of projects have been successfully completed. The following is a list of some of these completed final project reports.

All the project reports listed below are on file in 38-684. You may sign out any one for an overnight loan or for reading in the lab. You are free to make a copy of part or all of a report if you want to keep it for a longer time. The best and most interesting of your project reports will be used to augment this list for future terms.

It is often more satisfying to have projects which do something in addition to blinking LEDs. Examples are audio output, TV monitors, or VDT terminal displays.

Be careful – most unsuccessful projects were too complex. We will help you to size your project appropriately.

- Computer/Editor/Graphics

- 94-8 Video Editing in Real Time
- 94-11 OSCAR, Optical Character Recognition Machine
- 94-16 Digital Oscilloscope
- 96-3 Visually Controlled Pointer Device
- 96-7 An Object Tracker
- 96-15 A Personal Location and Navigation System at MIT
- 97-4 Stretch
- 97-9 Digital Postscript Imager
- 2000-2 The Design and Implementation of a Digital Oscilloscope
- 2000-4 Brushfire: A Hardware Platform for Running a Modern Operating System
- 2000-8 Design and Implementation of a General Purpose Computer based on the 6.004 Beta Architecture
- 2001-15 JPEG Decompression
- 2002-6 Design and Implementation of a Mandelbrot Set Generator
- 2003-3 Hardware RSA Encryption

- Games

- 90-1 Video Jigsaw
- 90-5 MEMRUC – The Game
- 90-7 Digital Othello
- 90-8 Connect Four Machine
- 90-10 Master Mind – A Video Game
- 92-9 Nerd Kit Asteroids

93-16 Tetris
 94-18 The 6.111 Pinball Machine
 95-1 Virtual Kaboom
 95-6 B-n-B Space Invaders
 96-4 Battleship
 96-6 The Pinball Project
 97-1 The Amazing Maze
 97-7 Ninja Master Fighting Game
 98-1 Core Wars
 98-9 Main Battle Tank
 98-12 Sign Language Hangman
 98-16 Automated Foosball
 99-9 Electronic Talking Battleship
 99-11 Pac-Man
 99-14 Wireless Marksmanship Trainer
 99-17 Air Connect Four
 99-21 3-D Maze Navigation
 2000-5 Stoplight Pitch Nintendo Shifting Controller Entertainment System
 2001-3 CTF.111 (Capture the Flag)
 2001-5 Super Mario Brothers
 2001-8 Monkey Box: an 8-bit Video Game platform
 2002-5 Nibbles
 2002-9 Mastermind against the Machine
 2002-11 Pokemon Punchout

- Music/Audio

90-3 A Digital Music Synthesizer
 90-4 A MIDI Controlled Digital Music Synthesizer [MIDI]
 90-12 The Magic Music Machine
 90-14 Γ: The Musical Project
 91-1 Air Piano
 91-7 Optical Music Recognition
 93-4 Programmable Multi-Channel Sound Synthesizer
 94-5 The Digital DJ
 94-9 The Multi-Mode Windowing Subtitling Machine
 94-10 Super Sampling Sound Sequencer
 94-13 The Digital Graphic Equalizer
 95-4 Self-calibrating Audio Equalizer
 95-14 Bach's Napkin
 96-11 BPM 2001: A Digital Odyssey
 97-2 The Virtual Conductor
 98-17 Humanoid Robot Ear Sound Localization
 99-22 Digital Air Band
 2001-7 Programmable Symphony
 2001-9 The Digital DJ
 2001-14 Rhythm Master
 2002-1 Music Capturing, Editing, and Playback Unit

2002-10 A Digital Turntable and Effects Processor

2003-6 Wireless MP3 Jukebox Computer

- Video

90-9 Video House of Mirrors

90-16 Video Jigsaw

91-5 The MCG-30 Raster Image Processor

91-6 Smart Vision

92-1 The \$6000 Answer to AT&T's \$1500 Videophone

92-5 Video Tracker

92-8 Digital Darkroom

93-9 Digital Video Mixing Board

93-10 Air Sketcher

93-11 Killer Crayons!

93-15 Recursive Picture Manipulation

94-2 Digital Poisson Engine

94-12 Video Chromakeying

95-11 Picture in Picture

95-12 Intelligent Picture-in-Picture Video

96-1 Design and Implementation of a PONG Game

96-5 The Digital Conductor

96-14 Real Time Sky Navigation Aid

98-3 Downtown Traffic Control Simulator

98-4 3-D Vector Graphics Engine

98-5 The Speed Detector

98-10 Design and Implementation of a Target Finding and Termination system

98-14 GEORDI: Generalized Enhancement of Real-time Digital Imagery

98-18 S.I.M.A.E.D. Still Image Magnification and Enhancement Device

99-10 RC4 Video Encryption

99-13 Touchscreen Phone

99-20 A Closed-Caption Decoder

2001-6 Mr. Etch-a-Sketch

2001-2 A Digital Video Security System

2001-10 Visual Target Tracking System

2002-7 Magnetic GamePen

- Speech and Communications

93-3 Telephone Switching System with Voicemail

93-17 Speech Synthesis Using Linear Predictive Coding

93-18 A Single Phone Line Demultiplexor

95-2 Time Multiplexed Single Line Communication System

98-2 A Flexible Dual Tone Multi Frequency Filter

98-11 A Voice Based Data Acquisition System

98-21 Home Security System with Telephone Interface

2001-4 Magnetic Card Reader

2002-8 Text Translator

- Robotics

- 90-2 2-D Robot Arm Solving the Shuttle Puzzle Mechanically
- 92-6 Robothello
- 94-6 Seeing, Object-collecting Robot
- 96-13 The Digital Duck Terminator
- 98-15 Robot See, Robot do
- 98-20 To Mars and Beyond
- 2000-1 Theseus
- 2000-6 Writing Robot
- 2000-7 OJ Rover
- 2001-11 Writing Robot
- 2002-2 The “A-Mazing” Robot *Starring Hank the Tank

- Miscellaneous

- 87-1 A Real Time Spectrum Analyzer with FFT
- 87-12 The Life Machine
- 90-13 Super Paint
- 92-2 ASPIRE Audio Signal Processor Ideally Realm Exclusive
- 92-3 Digital Patchbay
- 93-2 MAP (Map Algorithm Processing)
- 93-6 6.111 Lab 3 Sights and Sounds Unlimited: A Laser Light Show
- 94-4 The Conniption Machine
- 94-15 Dream Machine
- 94-17 Elevator Control System
- 93-7 Laser Diagnosis System
- 95-3 Attitude Control System for a Small Satellite
- 95-5 Infrared Security System
- 95-8 Chaotic Scrambler/Descrambler
- 96-9 Internet Message Board
- 98-13 Sonar with Pulse Compression
- 99-15 Digital Pet Parrot
- 99-16 Digital Billboard
- 2001-12 Power Wheels: An Autonomous Driving Machine
- 2002-3 Automatic Autobahn
- 2002-4 Digital Bookmark
- 2003-1 Digital Fan Control System
- 2003-2 Dialup Remote Weather System
- 2003-4 Affordable Eyecare: A Low Cost Autorefractor
- 2003-5 Wireless Electrocardiogram