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FACULTY OF ENGINEERING & TECHNOLOGY

BCS -504 Computer Graphics & Multimedia

Lecture-30

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OUTLINE

- **MIDI (MUSICAL INSTRUMENT DIGITAL INTERFACE)**

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MIDI :Musical Instrument Digital Interface

What is MIDI?

MIDI (Musical Instrument Digital Interface) is a protocol developed in the 1980's which allows electronic instruments and other digital musical tools to communicate with each other. MIDI itself does not make sound, it is just a series of messages like "note on," "note off," "note/pitch," "pitchbend," and many more. These messages are interpreted by a MIDI instrument to produce sound. A MIDI instrument can be a piece of hardware (electronic keyboard, synthesizer) or part of a software environment (ableton, garageband, digital performer, logic...)

The most common tool used to generate MIDI messages is an electronic keyboard. These messages may be routed to a digital synthesizer inside the keyboard, or they may be patched to some other MIDI instrument, like your computer.

When a key is pressed the keyboard creates a "note on" message. This message consists of two pieces of information: which key was pressed (called "note") and how fast it was pressed (called "velocity").

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What is MIDI?

MIDI (Musical Instrument Digital Interface) is a protocol designed for recording and playing back music on digital synthesizers that is supported by many makes of personal computer sound cards. Originally intended to control one keyboard from another, it was quickly adopted for the personal computer. Rather than representing musical sound directly, it transmits information about how music is produced. The command set includes note-ons, note-offs, key velocity, pitch bend and other methods of controlling a synthesizer. The sound waves produced are those already stored in a wavetable in the receiving instrument or sound card.

Since a MIDI file only represents player information, it is far more concise than formats that the sound directly. An advantage is very small file size. A disadvantage is the lack of specific sound control.

With a program that provides this interface, you can create music using a standard keyboard or other input device. You or others can then play your MIDI-conforming creation with the same or another program and a sound card as a music synthesizer. The MIDI program may come with a graphical user interface that looks like a sound studio control room. Many sound cards come as a package with MIDI software (for example, Media Vision's Pro Audio Studio 16).

The MIDI protocol uses eight-bit serial transmission with one start bit and one stop bit, has a 31.25 Kbs data rate, and is asynchronous. Connection is made through a five-pin DIN plug, of which three pins are used.

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Uses of MIDI

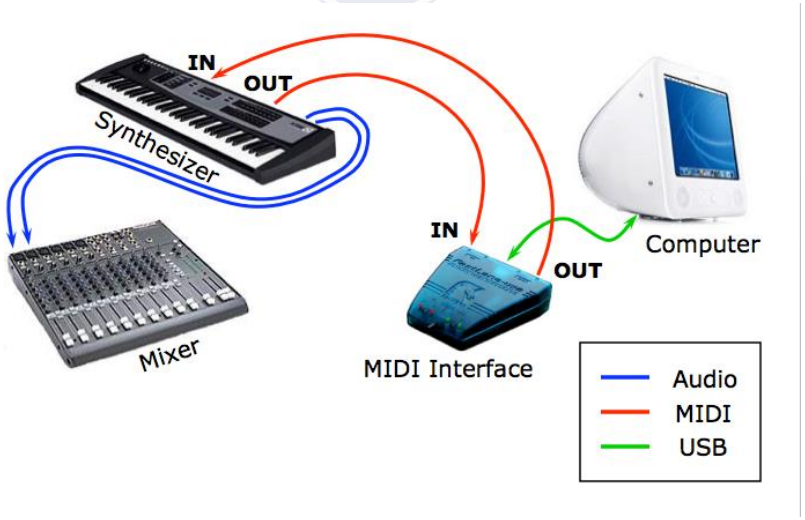
One of the most common applications of MIDI is in sequencers, which allow a computer to store, modify, record and play MIDI data. Sequencers use the MIDI format for files because of their smaller size compared to those produced by other popular data formats. MIDI files, however, can only be used with MIDI-compatible software or hardware.

MIDI is one of the most important tools for musicians and producers.

If you interact with any kind of digital music machine in your workflow, you're probably using it already.

With such an important part of the recording and mixing process it's hard to know where to start. MIDI is extremely powerful and using it can be confusing.

But it doesn't have to be intimidating. Using MIDI has so many benefits that learning how is worth the time it takes.



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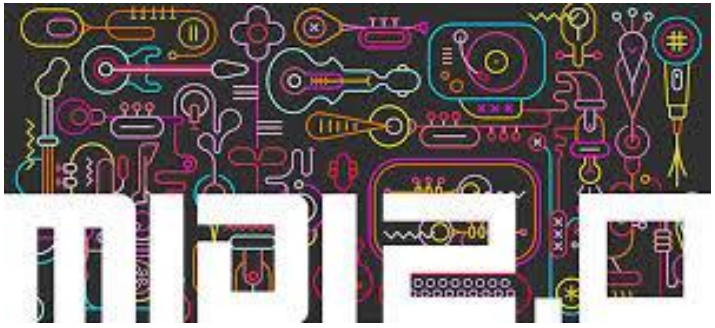
Introduction To MIDI 2.0

Nearly four decades on, it's clear that MIDI was crafted so well that it has remained viable and relevant. Its ability to join computers, music, and the arts has become an essential part of live performance, recording, smartphones, and even stage lighting. Now, MIDI 2.0 takes the specification even further, while retaining backward compatibility with the MIDI 1.0 gear and software already in use. Here's why MIDI 2.0 is the biggest advance in music technology in decades.

MIDI 1.0 messages went in one direction: from a transmitter to a receiver. MIDI 2.0 is bi-directional and changes MIDI from a monologue to a dialog. For example, with the new MIDI-CI (Capability Inquiry) messages, MIDI 2.0 devices can talk to each other, and auto-configure themselves to work together. They can also exchange information on functionality, which is key to backward compatibility—MIDI 2.0 gear can find out if a device doesn't support MIDI 2.0, and then simply communicate using MIDI 1.0.



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MIDI 1.0 vs MIDI 2.0

MIDI 1.0	MIDI 2.0
7 Bit velocity	16 Bit velocity
7 bit poly & channel pressure ,Pitch bend	32 bit poly & channel pressure ,Pitch bend
16,384 RPNs that use 4 controllers 16,384 NRPNs that use 4 controllers	16,384 Registered Controllers (32-Bit) 16,384 Assignable Controllers (32-Bit)
128 Control Change Message (7-Bit)	128 Control Change Message (32-Bit)

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Built For The Future

MIDI 2.0 is the result of a global, decade-long development effort. Unlike MIDI 1.0, which was initially tied to a specific hardware implementation, a new Universal MIDI Packet format makes it easy to implement MIDI 2.0 on any digital transport (like USB or Ethernet). To enable future applications that we can't envision today, there's ample space reserved for brand-new MIDI messages.

Further development of the MIDI specification, as well as safeguards to ensure future compatibility and growth, will continue to be managed by the MIDI Manufacturers Association working in close cooperation with the Association of Musical Electronics Industry (AMEI), the Japanese trade association that oversees the MIDI specification in Japan

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Multiple Choice Question

MUTIPLE CHOICE QUESTIONS:

Sr no	Question	Option A	Option B	OptionC	OptionD
1	……. plotting is done by converting a single coordinate position furnished by an application program into appropriate operations	Point	line	window	none of these
2	Point plotting is done by converting a ……...position furnished by an application program into appropriate operations	Unique	atomic coordinate	single coordinate	All of these
3	Discrete coordinate positions along the …….. are calculated from the equation of the line	sequential line path	line path	both a & b	none of these
4	For raster graphics device-level algorithms , object positions are specified directly in ……. device coordinates.	integer	float	character	none of these
5	DDA stands for	Digital differential analysis	Digital differential analyzer	Digitized differential analyzer	none of these

REFERENCES

- http://www.engppt.com/search/label/Computer%20Graphics