Re: DSP System

Source: http://sci.tech−archive.net/Archive/sci.electronics.design/2007−07/msg02895.html

- *From*: "Jon Slaughter" <Jon_Slaughter@xxxxxxxxxxx>
- *Date*: Fri, 20 Jul 2007 18:57:23 −0500

"David L. Jones" <altzone@xxxxxxxxx> wrote in message news:1184938708.873308.27310@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

> On Jul 20, 10:32 pm, "Jon Slaughter" <Jon_Slaugh...@xxxxxxxxxxx>
> wrote:
>
> > "David L. Jones" <altz...@xxxxxxxxx> wrote in
> > messagenews:1184928958.453879.133330@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
> >
> > > On Jul 20, 6:05 pm, "Jon Slaughter"
> > > <Jon_Slaugh...@xxxxxxxxxxx> wrote:
> > >
> > > > "David L. Jones" <altz...@xxxxxxxxx>
> > > > wrote in
> > > > messagenews:1184912759.591055.253980@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
> > > >
> > > > > On Jul 20, 1:55 pm, "Jon
> > > > > Slaughter"
> > > > > <Jon_Slaugh...@xxxxxxxxxxx>
> > > > > wrote:
> > > > >
> > > > > > How hard is
> > > > > > it to actually
> > > > > > implement a
> > > > > > DSP
> > > > > > system?
> > > > >
> > > > > I've been
> > > > > looking at
> > > > > the
> > > > > TMS320C6720

and some conversion devices and it seems I can gather all the components needed but I really don't have a good idea about how to go and implement something like that. The pdf's I've looked at on TI's don't really go into detail about how to actually put something together(atleast the one's I've seen).

All I want to do is take an analog signal, add some digital filtering(well, whatever I want once I get into the software side), and output the signal.

The digital conversion's seems pretty straight forward and I was plan on using something like the PCM1741 and PCM1807 or something similar for the conversion(although I ultimately want to go to 192khz).

I think all I'll need is the converters, memory, and the dsp? (I don't think I'll need a controller?) Is it going to be much harder than just hooking all these up together and then downloading some code to the dsp?

At this point I do not need anything fancy and just want to apply some effects like reverb and chorus to a signal for a start. The biggest problems at this point is the IC packaging for these devices as most are out of my reach(BGA, for example) for prototyping.

Is such a conceptually simple project out of my ability as a hobbyist? Do I need to come up with some prototyping schematic and get some pcb's made for

prototyping?
I'm really
not sure
how to go
about this
and I can't
find
any
documents
online that
can give me
some details
about the
process ;/

Any ideas?
Thanks,
Jon

What you need is a DSP
development board. They
will usually contain
all you need to get a project
like this off the ground − the
DSP
chip,
any required memory, a few
ADC inputs and DAC
outputs etc, many are
targeted specifically for
audio use. It's already done
for you.
TI have a complete range of
them:
http://focus.ti.com/dsp/docs/dspsupporttnp.tsp?sectionId=3&tabId=2079...

They aren't particularly
cheap, but it can save you
weeks of mucking
around with hardware, when
really a project like this is
all about
the
software.

> There is nothing really
> special about DSP's, they
> are essentially
> just
> a microprocessor with
> specilised hardware making
> them faster at math
> and signal processing
> functions than a regular
> microprocessor or
> microcontroller.

> I've looked at that but I can justify the
> expense. Its got, what,
> about
> 20−30$ worth of components and another
> 20−30$ for the pcb (if that)
> yet
> they
> want 400 for just a starter? If theres
> something I'm missing that
> makes
> it
> worth it then please let me know about it but
> it seems like its not
> worth
> it.
>
> Jon

> I forgot to mention that you don't need a DSP for audio
> processing
> these days, many of the 16/32 bit processors on the market
> can easily
> handle it. You might be able to score a processor
> development kit with
> an audio interface for cheaper than the DSP offerings
> perhaps.

Yes but I think ultimately this is what I want to learn since I have a
lot
of projects I would like to eventually work on that involve signal

> processing(all audio stuff). Although I was initially planing on doing it with the pc, I think it will be much more interesting to do it using a DSP
> processor(and I think it will be more enjoyable if I'm able to put together
> the hardware for it instead of just doing software).
>
> That hardware is essentially the same regardless of whether you use a micro, DSP, or FPGA with a processor soft core, the only real difference is in the speed of processing. In fact FPGA's are becoming very popular these days for DSP processing, with all sorts of DSP hardware slices built in to the FPGA fabric, that's where the future seems to be. But that is a much more difficult learning curve than a DSP processor.

Yes and that is something else I've been wanting to get into ;) DSP's though just seem more direct at this point and I have all the stuff to do it(just not necessarily to do it well). Again, the main issue with the DSP seems to be the documentation. I guess I just need to spend more time reading it though.

> If you write your code portable enough in C, the bulk of he software will be the same regardless of the hardware used. You can do the software development on the PC with a sound card and then port it fairly easily to your DSP chip and dedicated hardware.

True. The majority of the project is standard stuff though so I think the main issues are the hardware and dsp specific stuff.

> I can appreciate wanting to do the hardware aspect yourself though, have fun!

I hope ;)

Thanks,
Jon

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