Advanced Topics and Further Reading

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Advanced

DNS Captive Portal

When using the ESP8266 in access point mode, you probably want to redirect users to the right page. You can do this by creating a captive portal, using DNS. It's basically just a DNS server that will convert all host names to the ESP's own IP address.
This technique is also used by open Wi-Fi networks that redirect you to a login page before you can start browsing the internet.

Wi-Fi configuration

If you want to be able to change the Wi-Fi connection settings without re-uploading the code, you could take a look at the WiFiManager library by *tzapu*. This will try to connect to known networks, but if it fails, it will start a Wi-Fi access point. You can then connect to this access point, open the browser, and pick a network to connect to. The new configuration is saved.
The WiFiManager library uses a captive portal to present you with the right Wi-Fi settings page.
You could also implement a Wi-Fi manager yourself, or you can just check out the example that comes with the ESP8266 Arduino Core (Examples > DNSServer > CaptivePortalAdvanced).

I²S

The ESP8266 has an I²S bus on the RXD pin. It can run at 80MHz, and has DMA (direct memory access), so it's really fast. Its main purpose is to connect an I²S DAC (Digital to Analog Converter) to have an audio output, but you can use it for other things as well. For example, CNLohr managed to transmit analog television, by connecting an antenna wire to the I²S pin. You can also use it to control WS2812Bs LEDs. You can even use it to communicate over Ethernet (not really useful, and definitely not recommended, but it works).
Another great use for the I²S bus is outputting data to shift registers. This gives you extra outputs that are reasonably fast, for things like LEDs or stepper motors.

Other examples

You can find lots of other examples in the Arduino IDE, I'd recommend to check those out as well.

YouTube

There's some great channels on YouTube that do amazing things with the ESP8266. Here's a short list of the ones I'm currently following. If you've got more recommendation, just leave a comment!

- Andreas Spiess
- CNLohr
- Acrobotic
- Miika Kurkela