Fast simulation and prototyping with AFF3CT

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AFF3CT?

- Dedicated to the simulation of digital communication chain,
- Reproduces state-of-the-art simulation results,
- Can be used as an external library,
- Portable: Windows, MacOSX and Linux; x86 and ARM CPUs,
- Written in C++: parallel, optimized source code (SIMD, multi-threaded, multi-nodes),
- Open-source (MIT license): http://aff3ct.github.io

![Figure 1 – Simplified digital communication chain.](image)

**Table 1 – Non-exhaustive list of supported channel codes / decoders in AFF3CT. Throughputs are given on an indicative basis for 1 physical x86 CPU core (Intel Core i5-5300U @ 2.30GHz).**

<table>
<thead>
<tr>
<th>Channel code</th>
<th>Standard</th>
<th>Ref.</th>
<th>Decoder</th>
<th>Fixed point</th>
<th>Throughput (Mbps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDPC</td>
<td>5G, WiMAX, WiFi, DVB-S2, 10GE, etc.</td>
<td>[1, 2]</td>
<td>Sum-Product</td>
<td>Yes</td>
<td>5</td>
</tr>
<tr>
<td>Polar</td>
<td>5G</td>
<td>[3, 4, 5]</td>
<td>SC</td>
<td>Yes</td>
<td>500</td>
</tr>
<tr>
<td>Turbo</td>
<td>LTE (3G, 4G), DVB-RCS, CCSDS, etc.</td>
<td>[6, 7]</td>
<td>Turbo BCJR</td>
<td>Yes</td>
<td>100</td>
</tr>
<tr>
<td>BCH</td>
<td>CD, DVB, SSD, DVB-S2, etc.</td>
<td>-</td>
<td>Algebraic</td>
<td>No</td>
<td>100</td>
</tr>
<tr>
<td>Conv.</td>
<td>NASA</td>
<td>-</td>
<td>BCJR-MAP</td>
<td>No</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>BCJR-Linear</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>BCJR-Max</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

**Conclusion**

AFF3CT is a fast and flexible software tool for the simulation and prototyping of digital communication systems. It is open-source, portable and easily integrates in your environment.

**Acknowledgement**

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**References**