The TMarticle document class

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January 7, 2016

1 Code Listings

A test C++ program

```
void main(int argc) {
    // a test function with comment
    std::cout << "a string!" << std::endl;
    return 0;
}
```

Listing 1: testcode.cpp

2 Tables and Figures

N	Result	Absolute error	Time [sec]
5	0.1734	0.0193	0.0011
10	0.1864	0.0063	0.0675
15	0.1897	0.0030	0.8190
20	0.1910	0.0016	4.3892

Table 1: Presented is the computed integral, the absolute error in calculations as well as time elapsed for N integration steps. The time complexity of the integral itself is again $\mathcal{O}(N^6)$ however the numerical method is converging properly as opposed to the Legendre quadrature.

3 Warnings and bulletins

Test Warning

Malesuada ligula sociosqu faucibus a venenatis ridiculus ante scelerisque dui nulla leo platea condimentum vestibulum a aliquam. Libero litora ullamcorper justo diam nascetur parturient enim ad enim a nullam elit metus himenaeos dictum hac semper at adipiscing ac tempor laoreet hac parturient elementum.

Test Normal

Parturient metus senectus ut dis ante sit a id dis urna imperdiet neque fermentum vehicula consectetur varius feugiat tempus himenaeos ad nisi curabitur.Ultricies dis parturient nulla vel vestibulum sodales fames faucibus quis.

Test Critical

Iaculis ad ac vivamus scelerisque a ultrices a volutpat eget porta non mus scelerisque convallis dictumst.Condimentum velit consequat fringilla.

4 Proclamations

Theorem 4.1 (Fredholm Alternative)**.**
For any fixed $\mu \in \mathbb{C}$ the Fredholm alternative holds for the second kind Fredholm integral equation

$$(I - \mu K)u = f.$$

That is, either a) μ is not a characteristic value of K and the equation has a unique solution $u \in \mathcal{H}$ for any given $f \in \mathcal{H}$; or b) μ is a characteristic value of K and the corresponding homogeneous equation has non-zero solutions, while the inhomogeneous equation has (non-unique) solutions if and only if f is orthogonal to the subspace Ker$(I - \bar{\mu}K^*)$.

Proof. Left as an exercise for the reader. □

Lemma 4.2 (Volterra integral operator).
If K is a Volterra integral operator on $\mathcal{H}$ then there exists a constant $C > 0$ such that $\|K^n\|_{\mathcal{H}} \leq C^n/n!$, for any integer $n \geq 1$.

5 Icons

The icons are taken from the link given in the readme-file. Slight colorations done by me.