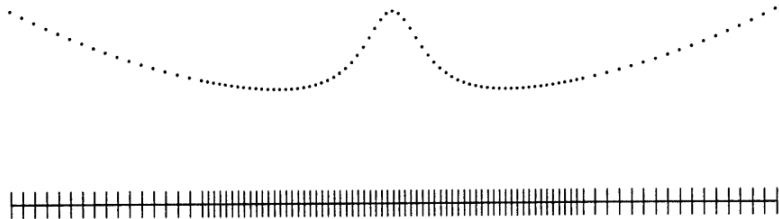


Adaptive Quadratures

Marcin Kuta

Adaptive quadratures



Adaptive quadratures

Algorithm 8.1 Adaptive Quadrature

procedure adaptquad(f, a, b, \hat{I})

$I_1 = Q_{n_1}(f, a, b)$

{ evaluate quadrature rules }

$I_2 = Q_{n_2}(f, a, b)$

$m = a + (b - a)/2$

{ compute midpoint of interval }

if $m \leq a$ or $m \geq b$ **then**

{ if no more machine numbers,
tolerance may not be met }

 issue warning

 return I_2

{ return best result }

end

if $\hat{I} + (I_2 - I_1) = \hat{I}$ **then**

{ if convergence tolerance met,
return converged result }

 return I_2

else

{ if convergence tolerance not met,
subdivide recursively }

 return (adaptquad(f, a, m, \hat{I}) +
 adaptquad(f, m, b, \hat{I}))

end

- [1] Michael T. Heath,
Scientific Computing. An Introductory Survey, 2nd Edition,
Chapter 8: Numerical Integration and Differentiation
2002