Rdocumentation

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`AUC_Spline_matrix_A` *Spline Interpolation Method - Matrix of Second Derivative Coefficients*

Description

In the area under the curve calculation using the spline interpolation method, the vector of the second derivative of the outcome of interest Y is expressed as $AY^{''} = BY + F$. This function calculate calculate the matrix A.

Usage

```
AUC_Spline_matrix_A(time)
```

Arguments

`time`	a numerical vector of time points of length m (x-axis coordinates).

Details

The tridiagonal matrix A is defined as (for the "not-a-knot boundary conditions): The jth line of the matrix, $A_{[j,\ :]}$ is given by

$$A_{[j,\ :]} = \left(\frac{1}{h_2}, -\left[\frac{1}{h_2} + \frac{1}{h_3}\right], \frac{1}{h_3}, 0, \cdots, 0\right)\ if\ j = 1$$

$$A_{[j,\ :]} = \left(0, \cdots, 0, \frac{1}{h_{m-1}}, -\left[\frac{1}{h_{m-1}} + \frac{1}{h_m}\right], \frac{1}{h_m}\right)\ if\ j = m$$

$$A_{[j,\ :]} = \left(0_1, \cdots, 0_{j-2}, \frac{h_j}{6}, \frac{h_j + h_{j+1}}{3}, \frac{h_{j+1}}{6}, 0_{j+2}, \cdots, 0_m\right)\ otherwise$$

Value

a tridiagonal matrix corresponding to the weights of the second derivative of the variable of interest in the spline interpolation method. In this version, the matrix is build considering the "not-a-knot" spline boundary conditions.

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