det(kA) is bounded below

$A + uu^T$

$\det(I + u^T A^{-1} u)\ \det(A)$

$\geq \det(I) + \det(u^T A^{-1} u)$

$A \to \int \mathrm{cov}(f'(t), f''(t)) \to$ in 2D case.

So A^{-1} converges.

In 3D case,

$\det(A) = \cancel{\ldots}\ (r-t)^2 \det(f'(t), f''(t), f'''(t))$

$\cancel{+O(1)}\ o((r-t)^2)$

$\Rightarrow \frac{\det(A)}{(r-t)^2} \to \det(\mathrm{cov}(f'(t), f''(t), f'''(t)))$

$\Rightarrow \det\left(\cancel{\frac{\det(A)}{(\ \ )}}\right.$ not right ~~but this does here~~ ~~an invertible limit~~

$\frac{A}{(r-t)^{2/3}} \to \underbrace{\mathrm{cov}(f'(t), f''(t), f'''(t))}_{B}$

$\Rightarrow \cancel{(r-t)^{2}}\,(r-t)^{2/3} A^{-1} \to \underbrace{\mathrm{cov}(f'(t), f''(t), f'''(t))^{-1}}_{B^{-1}}$