

# High order contact detection between fibres

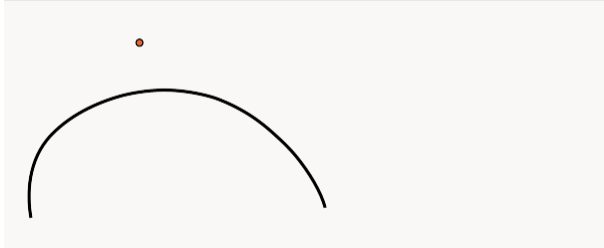
Emile Hohnadel   Octave Crespel   Thibaut Métivet   Florence Bertails-Descoubes

Univ. Grenoble Alpes, Inria, CNRS, Grenoble INP, LJK, Grenoble, France

## Motivation

- Evaluate contact forces in a fibrous assembly.
- Low order proxy is a source of spurious jumps in the force response.
- Propose an alternative algorithm to compute the closest point between pairs of curves.

## Contact detection methods



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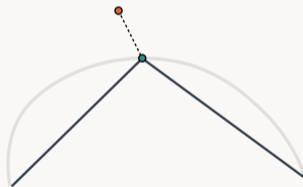
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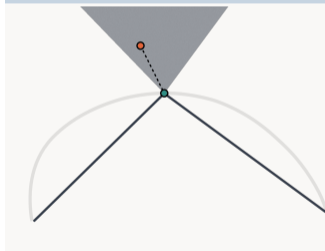
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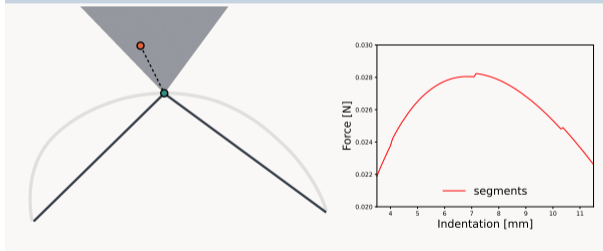
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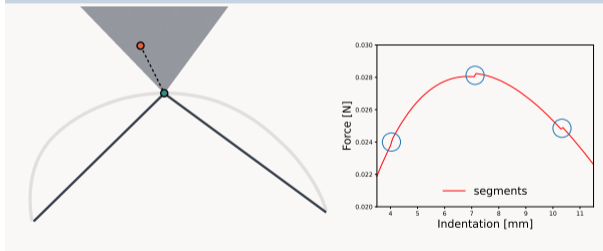
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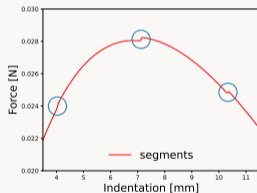
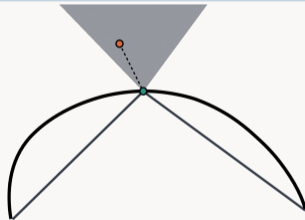
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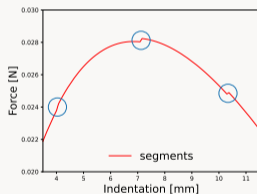
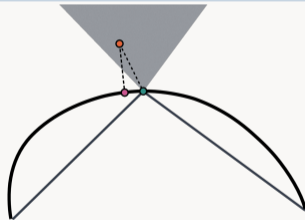
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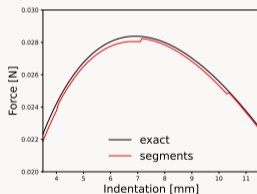
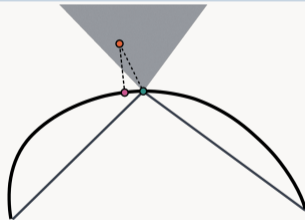
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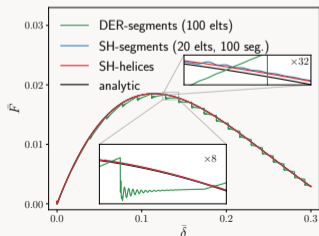
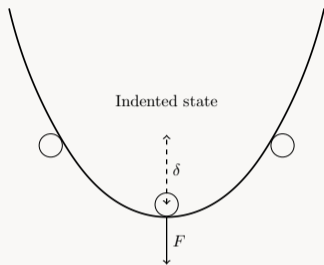
## Contact detection methods



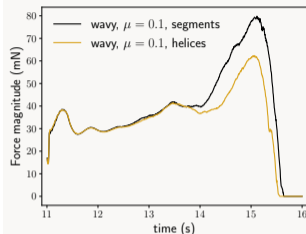
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## Curved three point test



## Hair wisp combing



## Bibliography



O. Crespel, E. Hohnadel, T. Metivet, F. Bertails-Descoubes. *Contact detection between fibres: high order makes a difference*, submitted.



F. Bertails, B. Audoly, M.-P. Cani, B. Querleux, F. Leroy, J.-L. L ev eque. *Super-Helices for Predicting the Dynamics of Natural Hair*, ACM Trans. Graph., 25 (2006).



M. Bergou, M. Wardetzky, S. Robinson, B. Audoly, E. Grinspun. *Discrete Elastic Rods*, ACM Trans. Graph., 27 (2008) 63:1-63:12



G. Daviet, F. Bertails-Descoubes, L. Boissieux. *A hybrid iterative solver for robustly capturing coulomb friction in hair dynamics*, ACM Trans. Graph., 139 (2011).