An update on Tapenade and on AD research at INRIA

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Administrative or politics status

The development team of Tapenade has recently hit a minimum.

Thanks to some concerned users, situation is now improving:

- On Jan 1st, INRIA hired a new senior researcher, Jean-Luc Bouchot
- Now recruiting an engineer for 18 months.
- Exploring other options to reach critical size. . .

Current status

Tapenade: a free and open-source AD tool:

- Source-Transformation AD, with global data-flow analysis.
- Applicable to Fortran (77,90,$\approx$03...) and C.
- Support for MPI, OpenMP, Cuda
- Data-flow reversal by stack storage (for the adjoint)
- Checkpointing on calls (by default),
  Binomial checkpointing (Griewank, Walther),
  Fixed-point adjoints (Christianson's method)

Recent technical advances

- Extension towards OpenMP (with Jan Hückelheim) and towards Cuda (with Onera)
- Asynchronous offload of the AD stack to files
- Profiling support to adapt choice of checkpoints (Jean-Luc)
- Open-source $\Rightarrow$ developer documentation and support.
- . . . and continued bug-fix support !

Plans for the future

- Fortran 2003 objects (with Michael Vossbeck)
- New directives to express linearity of externals.
- Dealing with the zoology of new AD models and settings
- Explore ST-AD of Julia ($\Rightarrow$ support multiple dispatch)