Manlab : Updates of the version 4.1.7

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August 30, 2019

Before the changes of this update, a simple remark to thank Olivier Thomas who wrote a tutorial for **Manlab**, released with the version 4.1.7. Additionally, some additional contents are available after the recent training courses that took place in Marseille.

1 Bugs fixed

- The first argument of the methods of a subclass @Syst class is always `sys`. It was alternatively `obj` and `sys` in the previous versions, causing issue in `Stability_HBM.m` function of @SystODE class.
- The stability computation was sometimes wrong because of the treatment of nearly singular Jacobian matrix. This bug has been fixed. Additionally the stability computation is now done exclusively in the method `StabilityComputation.m` of @Syst class.
- The test functions used to discriminate the simple bifurcations (branching points and fold bifurcations) from the period doubling bifurcations have been changed to avoid spurious period doubling detection (in the method `StabilityComputation.m` of @Syst class). There are now $\min_i(\rho_i - 1)$ and $\min_i(\rho_i + 1)$ instead of $\prod_i(\rho_i - 1)$ and $\prod_i(\rho_i + 1)$, for simple bifurcations and period doubling bifurcations respectively. The ρ_i are here the Floquet multipliers at the approximated bifurcation point. For more information about test functions, see *Beyn, W. J., Champneys, A., Doedel, E., Govaerts, W., Kuznetsov, Y. A., and Sandstede, B. (2001). Numerical continuation, and computation of normal forms. In In Handbook of dynamical systems III: Towards applications.*.

2 Additional possibilities

- It is now possible to choose the number of points displayed in the projected diagram. This can be done at Manlab launch by calling Manlab with option 'nbpts'. The empty examples show an example of this.
- When ones want to display the full diagram, efficient graphical procedures have been written. They have the names `plotdiag(...)` instead of `plotbranch(...)` and can be used directly in the global display function.
- The stability of differential systems of the type $M\dot{x} = f(t, x)$ (ODE systems with a non-singular mass matrix) is now available for @SystODE class.
- An additional example for @SystODE class has been added. It features a Van der Pol oscillator. The arising periodic orbit at the only Hopf bifurcation is continued with semi-automatic procedures.