



## Going solid & flirting with the margin

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1. Views expressed are those of the speaker alone.  
They are not endorsed by Eurocontrol or any ANSP.
2. Conflicts of interest.
  - Travel costs and honorarium for this conference provided by Eurocontrol.
  - Travel costs and honorarium as visiting professor at Deutsche Flugsicherung on several occasions.
3. The speaker is **not** an ATC expert.  
(The mileage you get may vary.)

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### Conclusions



1. Safety is dynamic. Production pressure constantly pushes operations towards the edge of failure.
2. Low accident frequency encourages *flirting with the margin*.
3. *Going solid* (dynamic tight coupling) makes the operating point movements large.
4. The second story: operators work to prevent the system from going solid.
5. Future safety work will explore second stories.

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### Always at the Edge of Failure

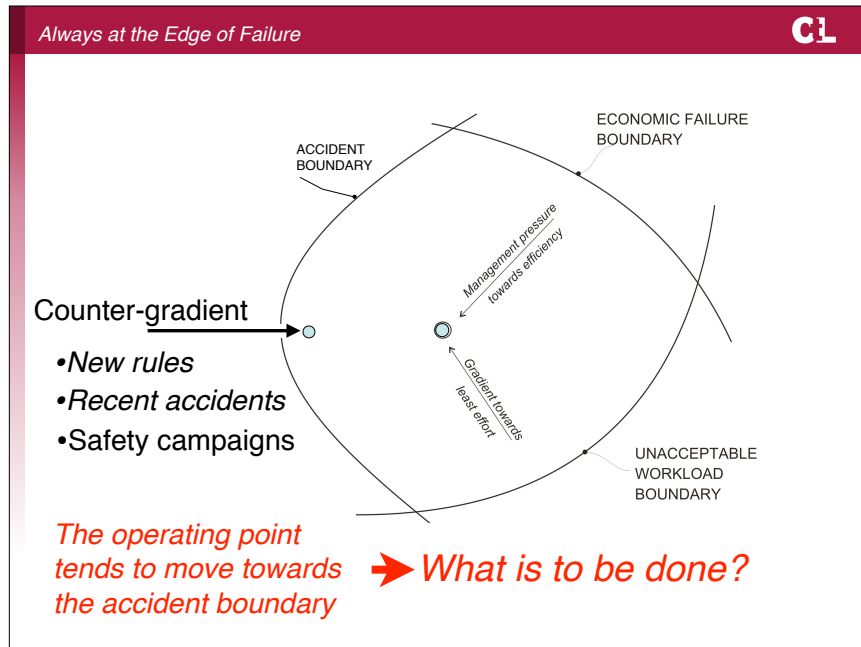


...we are talking about a law of systems development which is: *every system always operates at its capacity*. As soon as there is some improvement, some new technology, we stretch it...

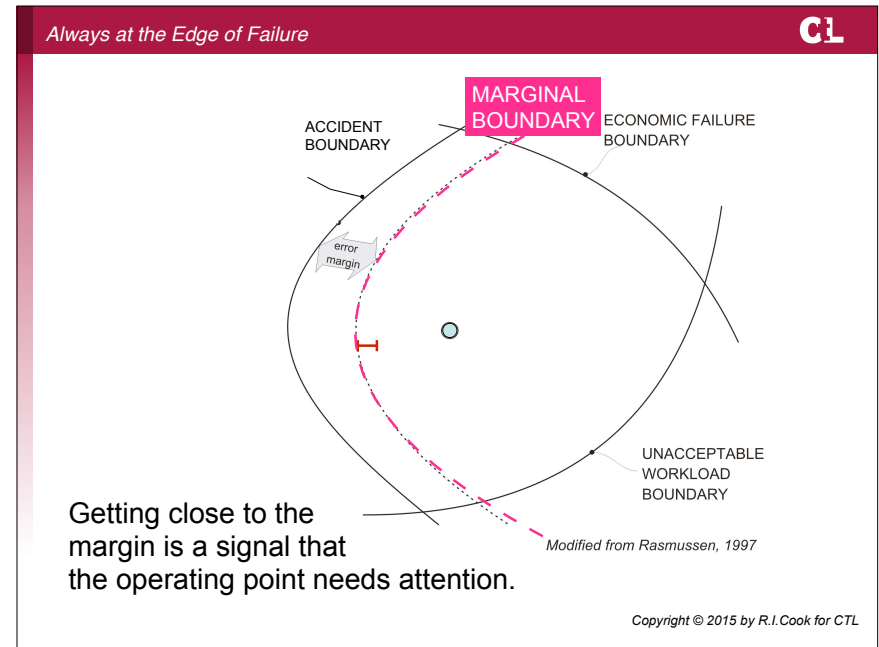
Larry Hirschhorn  
quoted in Cook & Woods,  
A Tale of Two Stories, 1997.

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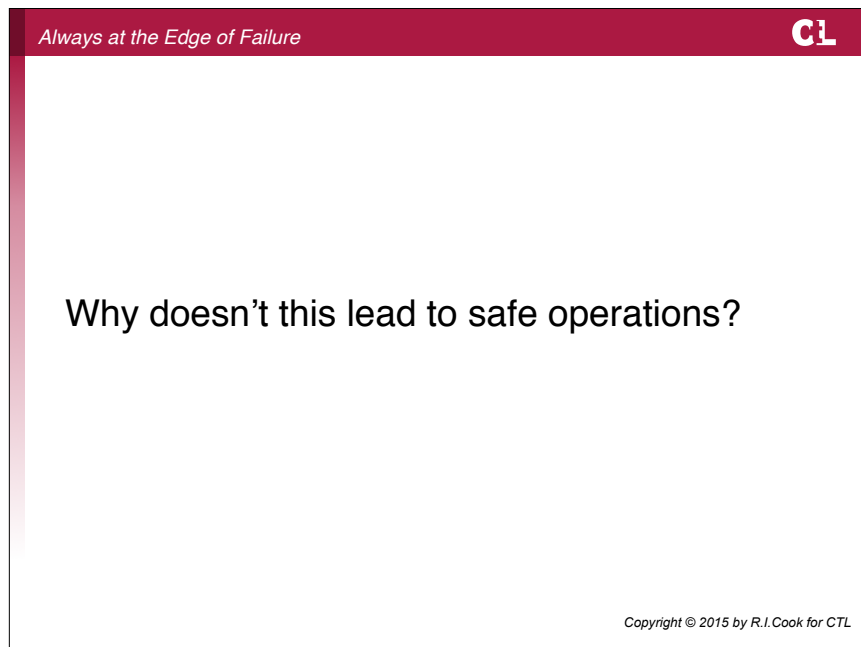
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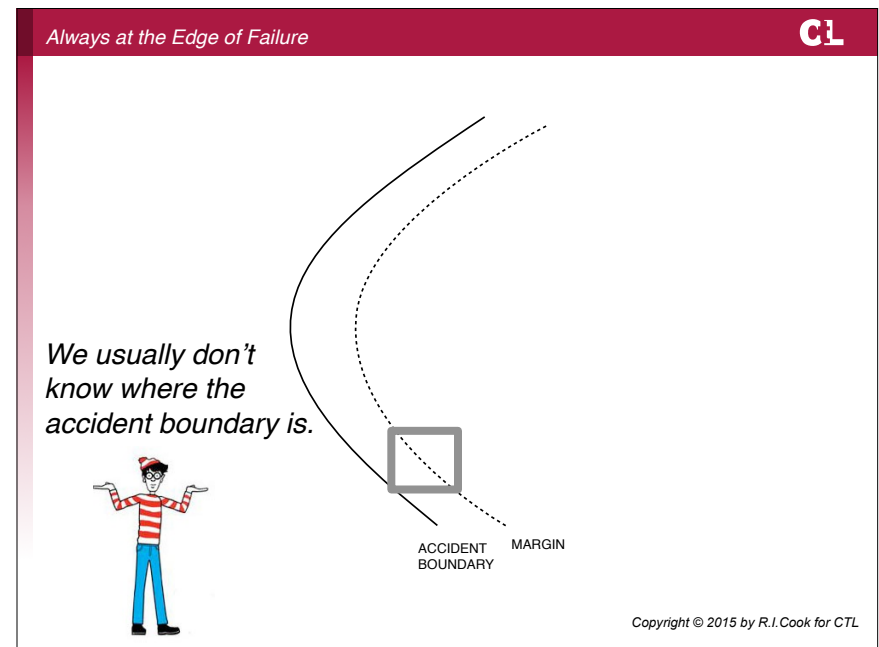
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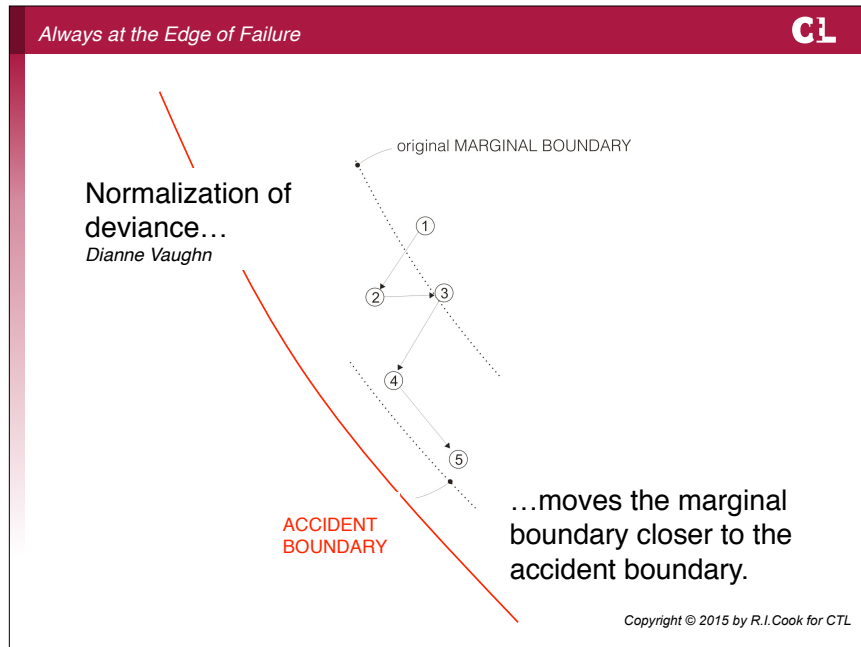
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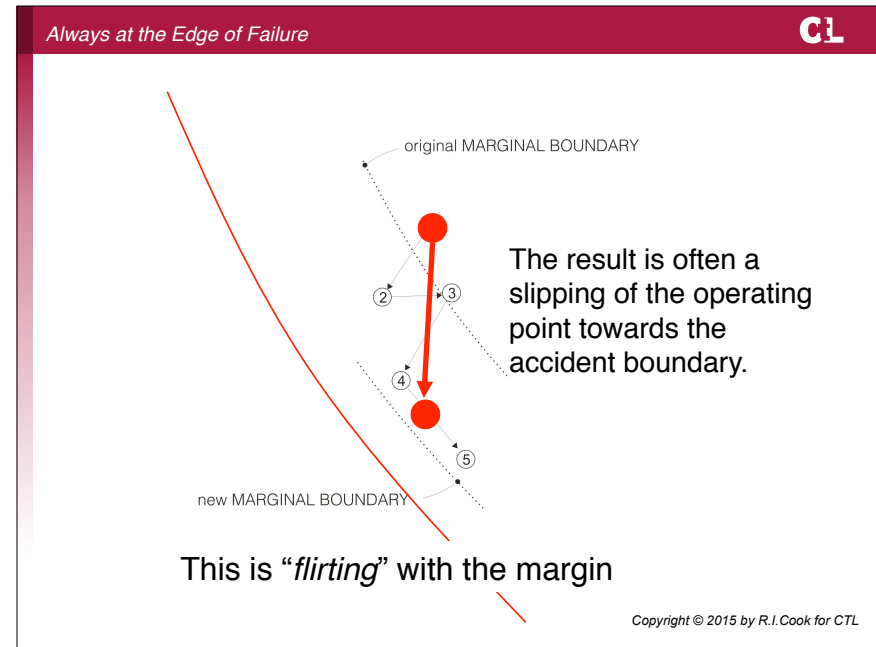
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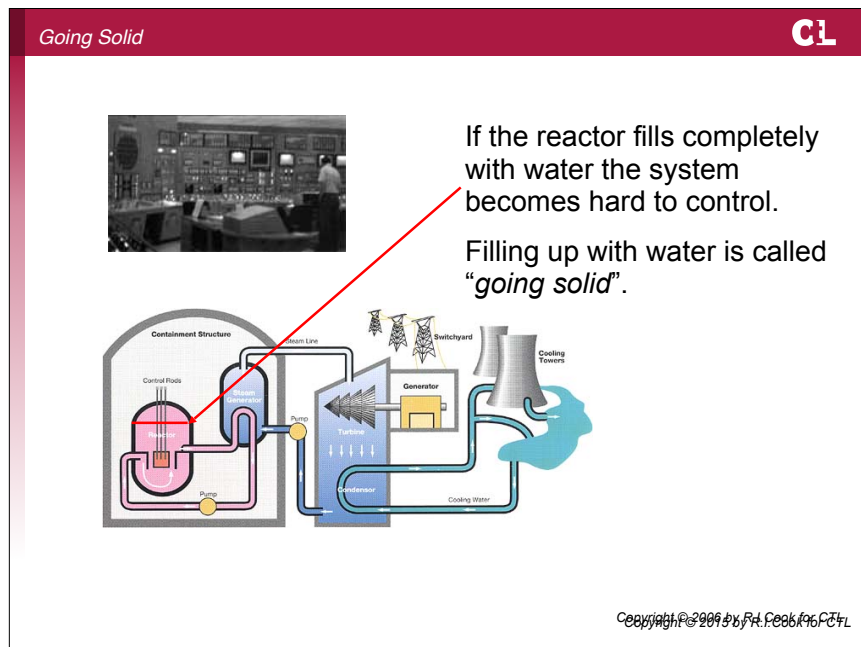
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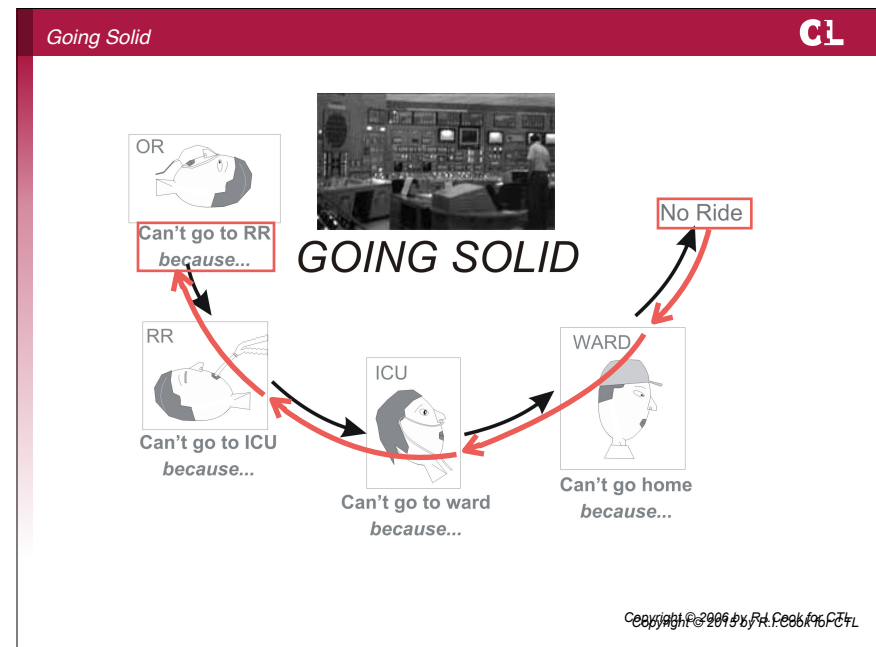
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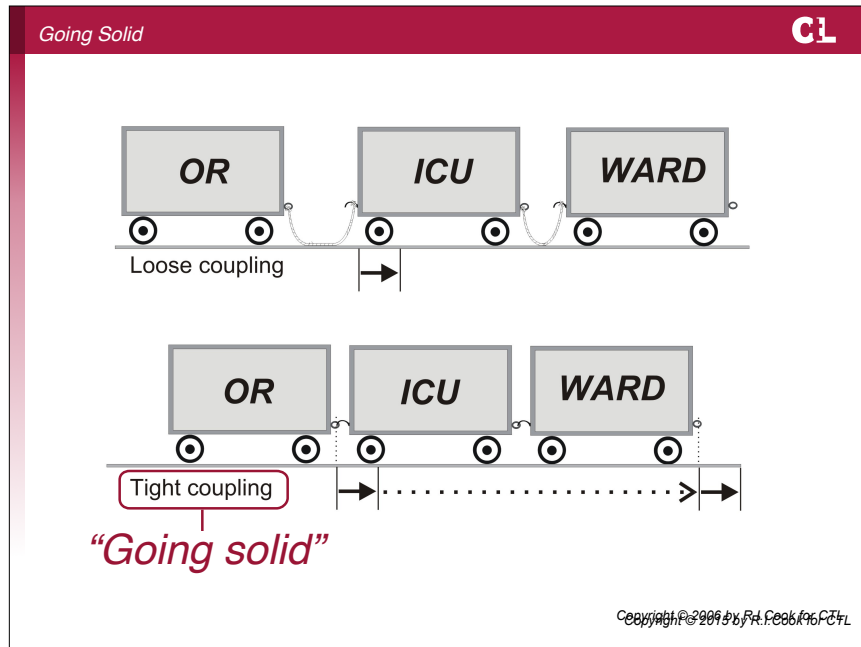
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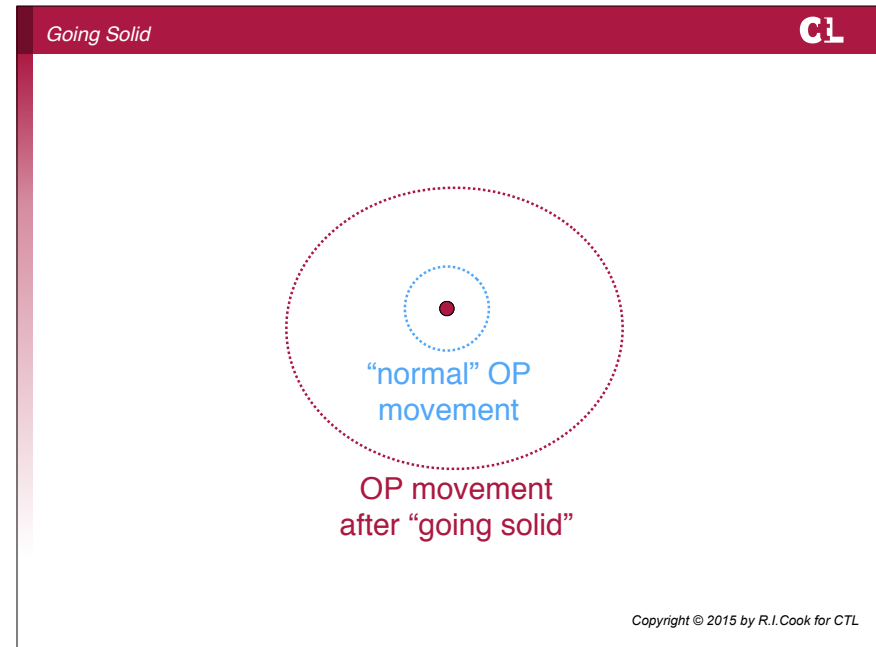
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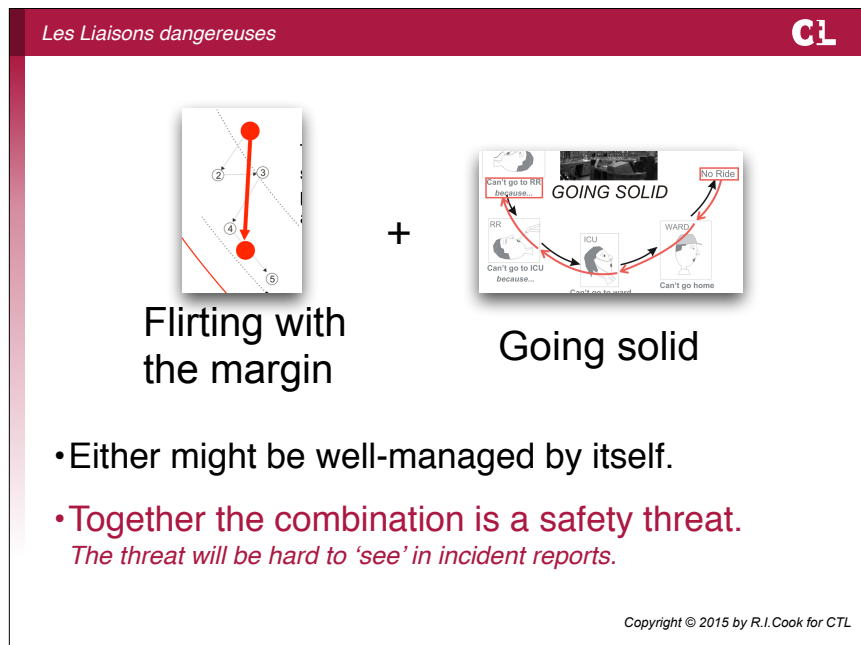
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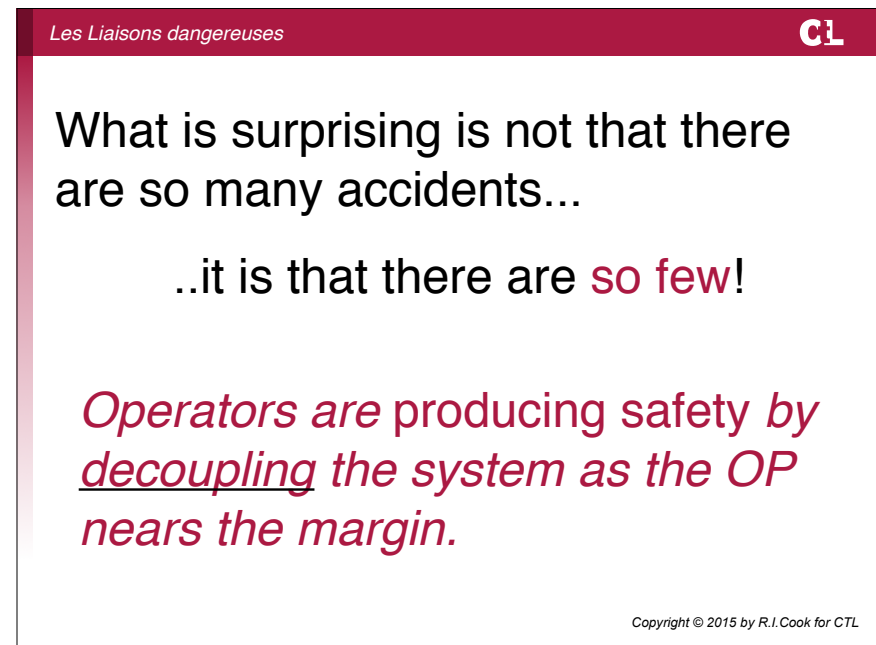
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*Les Liaisons dangereuses*

*But how? (this is the **big** research question in safety)*

*What operational tactics do we observe?*

- Flexibility in resource assignment
- Dynamic restructuring of task work
- Deliberate tradeoffs (e.g. explicit goal sacrifices)
- Reactive measures

*What should be the strategic approach?*

- Second story inquiry (e.g. study sector splitting & other decoupling methods)
- Looking at recovery
- Better anticipation help (e.g. visualization tools)

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**Thank you for your kind attention!**

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