What methods in literature can help improve the collaborative skill of robotic systems?

Topics to be research

* Robots learning from humans
* Robots learning from robots
* Robotic evaluation
* Robots improving their skill level
* Robotic mutation

Key terms

* Collaborative skill
* Evolutionary collaborative skill (skill evolution)
* Mutating skill
* Reward/cost function
* Controller
* Imitation learning

Techniques

* Learning by Human Guidance
  + Actively teaching by demonstrations
    - Programming by demonstration (PbD)
    - Learning from human demonstration (LfD)
  + Probailistic Movement Primitives

I started out with setting the base for my literature research. As mentioned in your e-mail, the best way to start is by setting up a short memo about the scope of my research. The first step is to set up the research interest of my master thesis. As discussed, the research will be based on the paper of Humanoids 2017, and especially the effect of a mutated collaborative skill of robots. The interest of this research will therefore be as following:

* Mutated collaborative skill after learning (one robot to another)
* Evolutionary collaborative skill level (this research is the first step towards this)
* Mutated reward/cost function in robotic collaborative task

The research question of the literature that came up with is:

*What methods in literature can be used for robotic learning from collaborative task execution?*

*How do existing methods continuously learn skill during collaboration with humans and how the learned skill change during the leaning process?*

While this question captures the different methods already out there in collaborative robotics, I did find it a bit difficult to directly match it to evolutionary collaborative skill. Relating to this last part, this research will be the first step towards this idea. As I tend to iteratively change the question during my research, to eventually match the entire scope of the research, I do not see this as a problem for now. In order to do so, I also came up with a few points where to start my research with:

* Robots learning from humans
* Robots learning from robots
  + Robot-to-robot
  + Robot-to-robot learning
  + Social learning
  + Transfer learning
* Robotic evolution – Evolutionary Robotic Learning
  + - Motor babbling
  + Intrinsic motivation
    - Reinforcement Learning
  + Genetic Algorithm
  + Evolutionary algorithms
  + Evolutionary robotics
* Robots improving their skill level (in general)
* Robotic mutation
* Online/continuous Robot Learning
* Robot Reinforcement Learning
* Incremental Robot Learning
* Dynamical Movement Primitives
* Skill encoding

The last point (robotic mutation) should always be kept in mind when researching any topic, as this is the main goal of the research. The other points I choose to determine the state-of-the-art in robotic collaborative tasks.  
  
I tried to set up the points named before, based on the Humanoids 2017 paper and the conversations we had before. Therefore, I am aware that it is not perfect yet. Throughout the next weeks, I will update them iteratively.

I would like to get your feedback on this if possible.

Based on the guide (which you also send me), I also came up with some key terms which might come in handy during literature research:

* Collaborative skill
* Evolutionary collaborative skill (skill evolution)
* Mutating skill
* Reward/cost function
* Controller
* Humanoid robot

Limitation of research

* No black box – Optional
* Only focus on human like robots
* Only focus on arm