

## 1 Team PML 30 -Y

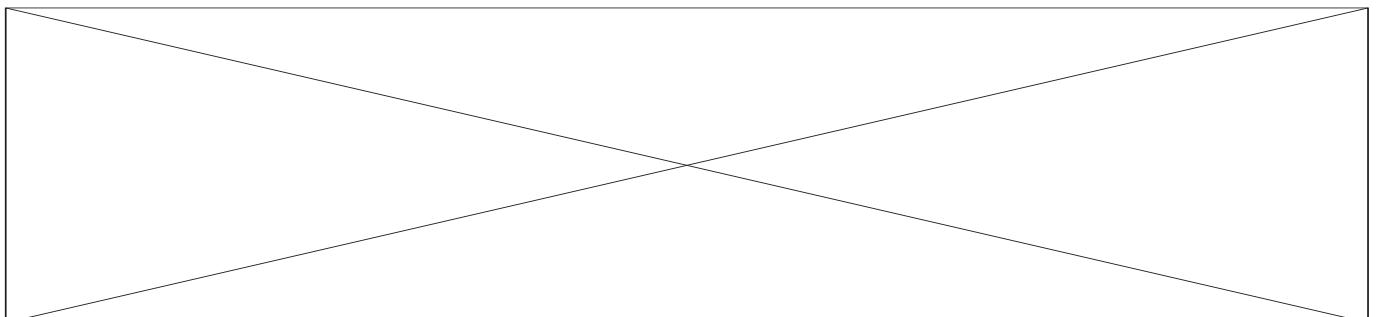
Team PML 30 - Y was assembled in October 2015 in Saint-Petersburg, Russia from 2 novices and 3 participants with experience, who took part in PML30 -  $\varphi$  and PML 30 -  $\psi$  teams in season 2014 - 2015. New team is based on the FTC teams that existed in our laboratory since October, 2012.

Tasks and roles of robot designing were distributed among the participants, and safety rules were established. At the first place we put spreading principles of gracious professionalism to others. All decisions were made collectively inside team with discussion to find the most optimal solutions, every idea was discussed in details to avoid missing interesting idea or making wrong decision.

During the year we took part in many events and everywhere we have tried to attract attention to our team, encourage people to take part in FTC and helped competitions organizers in the way of explaining rules and making regional qualifiers as official as regional finals. Also we pursued and distributed the principles of gracious professionalism. Talking to the press, we hoped to attract more attention to our team and to the competition in general, as well as attracting sponsors. The latter was important because of the need for funds - purchasing materials and equipment costs a lot.

The team took part in the three qualifying competitions and in the regional finals. We have met number of team there and share our experience with them. Aside from meeting new teams we also kept in touch through Facebook with teams we met during previous years: Stuy Fission 310 from USA who we met in Sochi last year, a team from Romania, Auto Vortex who we met on regional finals the same season. Also, there is an active group chat with a large number of Russian teams. You can find the team page in Facebook at the address <https://www.facebook.com/pages/FTC-team-PML30-PHI>. To increase the efficiency of our team work we used the version control system GitHub, which allows the entire team to work simultaneously on a single projects without losing files and providing easy way to resolve problems. Also for writing technical books we had used professional typesetting system LaTeX.

For our team spreading information about FTC is very important and we try to motivate to take part in it as much people, as possible. We consider FTC very useful and interesting competitions, so we are very happy to participate in it.



### 1.0.1 Instructors

Luzin Dmitry

*Head of Robotics Department in Phys-Math Lyceum 30, Saint-Peterburg, Russia. Main coach of FTC team.*

*Information: 25 years old, in robotics 5 years, in FTC 3 years.*



Luzina Ekaterina

*Professor of Robotics Department in Phys-Math Lyceum 30, Saint-Peterburg, Russia. Tutor of FTC team.*

*Information: 25 years old, in robotics 5 years, in FTC 3 years.*



Fedotov Anton

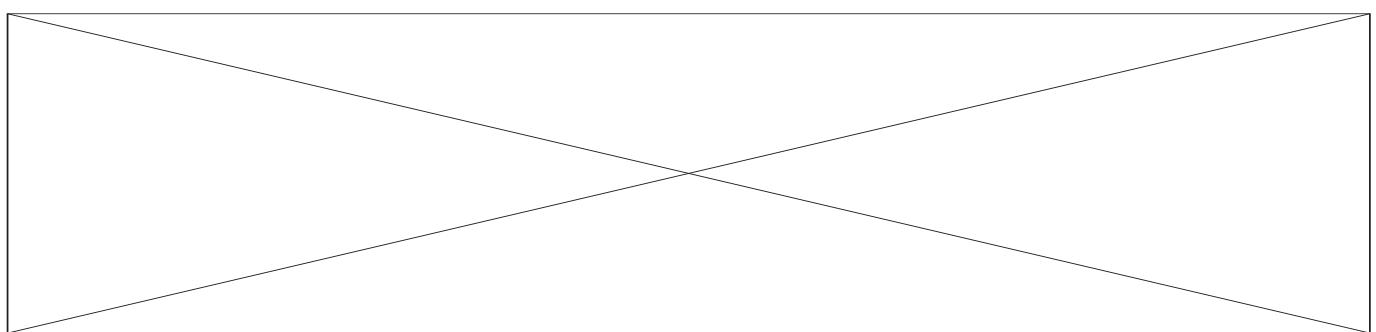
*Professor of Robotics Department in Phys-Math Lyceum 30, Saint-Peterburg, Russia. Tutor of FTC team.*

*Information: 22 years old, in robotics 4 years, in FTC 3 years.*

Krylov Georgii

*Professor of Robotics Department in Phys-Math Lyceum 30, Saint-Peterburg, Russia. Tutor of FTC team.*

*Information: 18 years old, in robotics 4 years, in FTC 4 years.*



### 1.0.2 Team members

Nikita Safronov

*Role in team: captain, reserve drive-operator, responsible for writing the technical book, responsible for elevator and winch.*

*Information: 17 years old, in robotics 4 years, in FTC 2 years.*

*Why I chose FTC: "I have chosen FIRST because I enjoy working with mechanisms and finding unusual technical decisions for solving problems. Also working on this project helps me to get new skills in a sphere of engineering. In this case I know, that I don't spend my time in vain."*



Anton Ponikarovsky

*Role in team: , communication with other teams and community, reserve operator-2, responsible.*

*Information: 17 years old, in robotics 3 years, in FTC 2 year.*

*Why I chose FTC: "I decided to join FTC because I believe that this competition is one of the most challenging of those, which are familiar to me. It requires responsibility, capability of working in team, communication with other teams, working on hardware, software and even technical documentation. All the experience you accumulate through doing FTC, you can apply in your future profession, if it is technical oriented."*



Alexandr Iliasov

*Role in team: operator-2, decorating robot, Power Design, responsible for the bucket.*

*Information: 16 years old, in robotics 3 years, in FTC 2 year.*

*Why I chose FTC: "I choose to partipucate in the FTC, because it requiers many skills in a lot of interesting themes: physics, engineering, programming, geometry. Also, you need to work in team, argument your choise and listen others. You need find problems and solve it. All that skills you can obtain in FTC."*



Andrew Nemow

*Role in team: drive-operator, responsible for the writing the program, responsible for debris collecting systems.*

*Information: 16 years old, in robotics 2 years, in FTC 1 years.*

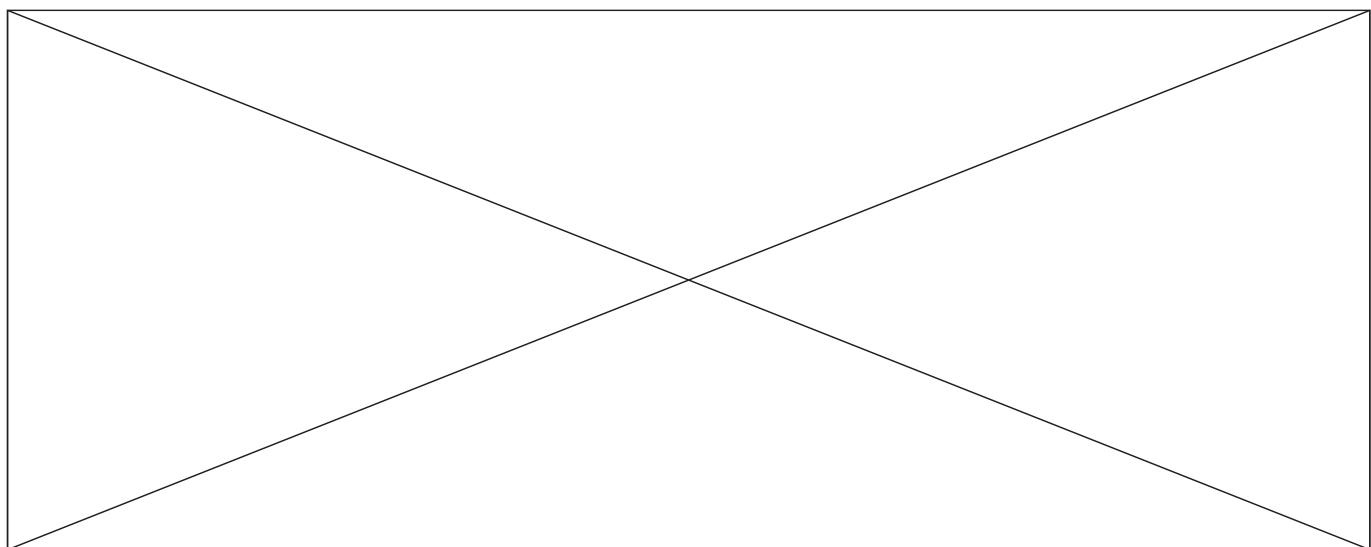
*Why I chose FTC: "When I first I attended the event FTC saw hefty metal robots, with enthusiasm and without hesitation decided that I would like to do this."*

Gordei Kravzov

*Role in team: development strategy in the game, responsible for chassis.*

*Information: 16 years old, in robotics 2 years, in FTC 1 year.*

*Why I chose FTC: "I enjoy making huge and complicated mechanisms work, that's why I chose FIRST FTC. In my opinion it's a great way to improve your skills and broaden the mind doing something that you love by the whole heart."*



## 1.1 Key summary

**DESCRIPTION:** Here are marked the tactical and technical characteristics of the final version of the robot.

*Таблица 1: Tasks that the robot can perform according to its construction.*

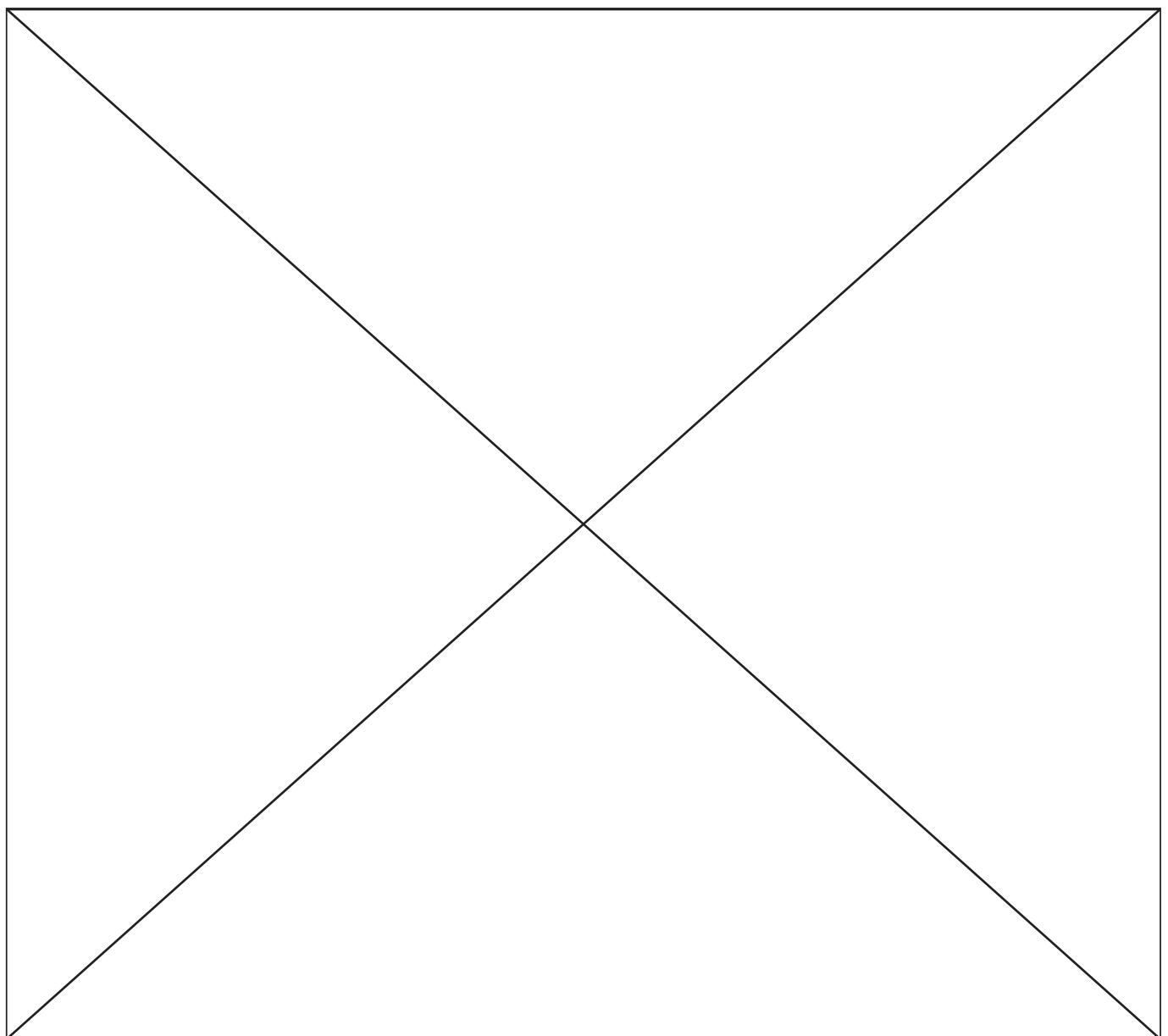
Tasks	Ability
Score climbers into shelter in autonomous period.	Yes.
Push the button on rescue beacon in autonomous period.	No.
Stay in beacon repair zone at the conclusion of autonomous period.	Yes.
Climb on mountain in autonomous period.	No.
Block the opponent's autonomous movement.	No. We consider that blocking is unfair.
Score zip-line climbers in tele-op period.	Yes, first and second ones.
Score debris in floor goal.	Yes.
Score debris in every mountain goal.	Yes.
Stay fully in low zone at the conclusion of tele-op period.	Yes.
Stay in second or top zone or pull-up at the conclusion of tele-op period.	No.
Turn the "All Clear" signal.	Yes.

*Таблица 2: Consequence of performing tasks in the match*

Task	The time needed to perform (sec)	Points
<i>Autonomous period</i>		
Score climbers into shelter.	20	40
Stay in beacon repair zone.	10	5
<i>Autonomous total</i>	30	45
<i>Tele-op period</i>		
Score low and second zip-line climbers	15	40
Score 10 cubes ( $5\text{cubes} \cdot 2\text{times}$ ) into the top goal.	90	150
We can score 10 cubes ( $5\text{cubes} \cdot 2\text{times}$ ) into the second goal instead of top if it would be pre-discussed with ally.	90	100
Turn the "All Clear signal"	15	20
Stay in low zone at the conclusion of tele-op period.	—	10
<i>Tele-op total</i>	120	220 (170)
<i>Game total</i>	150	265 (215)

*Таблица 3: Actions in extraordinary situations*

Situation	Action
The autonomous program didn't run.	Score climbers into shelter in tele-op period.
Scoring debris into mountain goals is impossible due to break.	Score debris into floor goal.
Our ally lost ability of scoring debris into mountain goals in case he was to score debris into the top goal.	Firstly, we ask ally if we can score debris into the top goal instead of them. If he confirms that we can perform his game objective, we start scoring debris into top goal as it gives more points. If he rejects the suggestion (if, probably, alliance robot can't leave the mountain), we continue performing our game objective



## 1.2 Leaflet for teams

Nikita Safronov

*Role in team: captain, reserve drive-operator, responsible for writing the technical book, responsible for elevator and winch.*

*Information: 17 years old, in robotics 4 years, in FTC 2 years.*

*Why I chose FTC: "I have chosen FIRST because I enjoy working with mechanisms and finding unusual technical decisions for solving problems.*

*Also working on this project helps me to get new skills in a sphere of engineering. In this case I know, that I don't spend my time in vain."*



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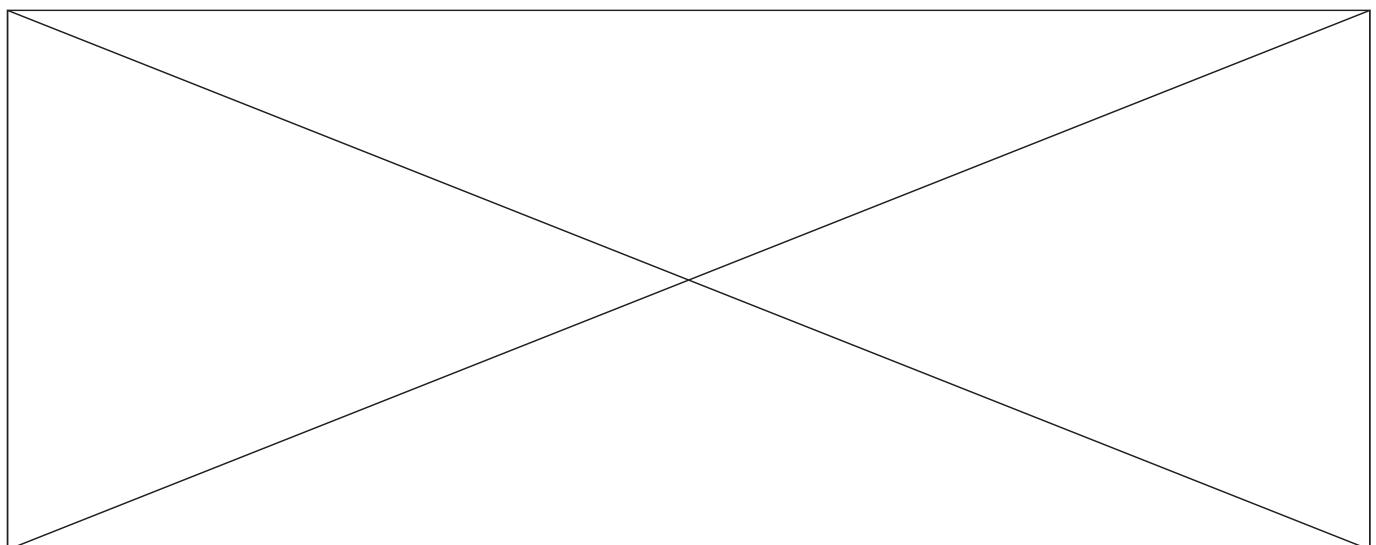
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### 1.3 Leaflet for judges

Nikita Safronov

*Role in team: captain, reserve drive-operator, responsible for writing the technical book, responsible for elevator and winch.*

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