










fastar-jiraProject: [behameetrics-learn](#)

Sorted by: Priority descending, then Updated descending












1-220 of 220 as at: **02/Apr/19 21:10**

Key	Status	Sprint	Created	Updated	Assignee	Description	Acceptance criteria	T	Summary
BEL-68	DONE	BEL Sprint 2	29/Oct/18	05/Nov/18	Matej Končál	Create repository with appropriate name in https://gitlab.com/tp-fastar			BEL-25 / Create repository for ML module
BEL-67	DONE	BEL Sprint 2	27/Oct/18	27/Oct/18	Matúš Kalafut	Configure the server to send an Access-Control-Allow-Methods response header that includes Content-Type			BEL-56 / Enable CORS and bulk insert on server-side
BEL-82	DONE	BEL Sprint 3	06/Nov/18	17/Nov/18	Michal Manak	For each mouse movement compute horizontal/vertical velocity and acceleration. Matej Končál suggest to write general function which accepts function in parameter and compute output (e. g. velocity) by passed function Use raw_logs.csv from http://www2.fiit.stuba.sk/~kratky/biometrics/data/web_ident_mouse/index.html . Select data from one user and count on them. We will do it per user session later.			BEL-79 / Compute acceleration and jerk for each axis
BEL-69	DONE	BEL Sprint 2	29/Oct/18	05/Nov/18	Michaela Balážová	For each event identify session in which event was logged. Matej Končál suggestion 2 events from same user belong to same user session, if their time difference is less than 30min. But make it general, so i want to change 1 variable to modify time threshold Use raw_logs.csv from http://www2.fiit.stuba.sk/~kratky/biometrics/data/web_ident_mouse/index.html			BEL-25 / Identify user sessions
BEL-70	DONE	BEL Sprint 2	29/Oct/18	05/Nov/18	Matej Končál	For each mouse movement compute horizontal/vertical velocity and acceleration. Matej Končál suggest to write general function which accepts function in parameter and compute output (e. g. velocity) by passed function Use raw_logs.csv from http://www2.fiit.stuba.sk/~kratky/biometrics/data/web_ident_mouse/index.html . Select data from one user and count on them. We will do it per user session later.			BEL-25 / Compute velocity and acceleration
BEL-71	DONE	BEL Sprint 2	29/Oct/18	05/Nov/18	Matej Končál	For each event identify segment to which event belongs to. Split can be determined according to time interval, silence time, ... Matej Končál suggest to write general function which accepts function in parameter and identify split threshold by passed function Use raw_logs.csv from http://www2.fiit.stuba.sk/~kratky/biometrics/data/web_ident_mouse/index.html . Select data from one user and count on them. We will do it per user session later.			BEL-26 / Split events to segments
BEL-18	DONE	BEL Sprint 1	08/Oct/18	15/Oct/18	Kamil Janeček	Create JIRA methodoogy.			BEL-17 / JIRA methodology
BEL-17	DONE	BEL Sprint 1	08/Oct/18	22/Oct/18	Michal Manak	Create all required methodologies.			Methodologies
BEL-50	DONE	BEL Sprint 1	10/Oct/18	21/Oct/18	Kamil Janeček	Find correct way to test python Flask applications. pytest some dependency injection or correct way to mock modules so we can easily make unit tests.			BEL-23 / Tests and DI

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BEL-1	DONE		02/Oct/18	15/Oct/18	Kamil Janeček		VM is setup correctly (nginx, jira, confluence, firewall, product app, TLS) Website is created and deployed.		VM setup
BEL-4	DONE		02/Oct/18	08/Oct/18	Michal Manak	Gitlab-CI -> copy to VM. / create user, folder, nginx settings/			BEL-1 / Setup webpage deploy to VM
BEL-127	DONE		04/Dec/18	02/Apr/19	Unassigned	Default: No technique (do not handle class imbalance)			Select technique for handling class imbalance for user authentication
BEL-222	READY FOR REVIEW		26/Mar/19	02/Apr/19	Tomáš Jendrejčák				Fix ml-module generated documentation
BEL-223	DONE	BEL Sprint 10	01/Apr/19	01/Apr/19	Matej Končál				Gunicorn worker timeout when trying to download large dataset
BEL-190	DONE		25/Feb/19	01/Apr/19	Matej Končál	Create configuration (docker-compose.yml) for public users. Include configuration with and without mongo database.			Create server configuration for public users
BEL-33	IN PROGRESS	BEL Sprint 10	09/Oct/18	01/Apr/19	Matúš Kalafut	As a researcher I want to highlight segments in raw data so that I could focus on the information given by the segment to increase my efficiency of raw data examination. Assume that `segment` is a column denoting the segment each raw data row belongs to. Then highlight that segment. Example: For mobile data, – each segment is delineated by `TOUCH_START` and `TOUCH_END` events. Upon hovering, highlight the touch data, and zoom in on the matching accelerometer and gyroscope data. Inspiration: https://i.stack.imgur.com/4RtYo.png	Jupyter-notebook containing working example		Highlight segments in raw data
BEL-216	DONE	BEL Sprint 9	16/Mar/19	01/Apr/19	Matúš Kalafut				BEL-183 / Visualize mobile data
BEL-224	TO DO	BEL Sprint 10	01/Apr/19	01/Apr/19	Unassigned				ML module documentation not generating
BEL-37	IN PROGRESS	BEL Sprint 10	09/Oct/18	01/Apr/19	Michal Manak	Custom events should be marked differently from sensor events (such as `MOUSE_DOWN`). For now, let each custom event be marked the same (since custom event arguments are completely arbitrary). By default, apply custom events to all currently displayed plots (e.g. mobile devices - all sensors - touch, acc, gyro).	jupyter notebook with working examples - using mouse data && visualisation		Add custom events to visualized data
BEL-198	IN PROGRESS	BEL Sprint 10	27/Feb/19	27/Mar/19	Tomáš Jendrejčák	As a researcher I want to visualize metrics at curve points so that I could obtain precise information about the metrics. Apply this to all curves currently implemented: FAR-FRR, ROC and DET.	working example in jupyter-notebook		Display metrics at curve points
BEL-221	IN PROGRESS	BEL Sprint 10	26/Mar/19	27/Mar/19	Matej Končál	only for required functions – research needed https://scikit-learn.org/stable/modules/generated/sklearn.base.TransformerMixin.html			Create sklearn compatible transformers for behlearn functions











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BEL-114	READY FOR REVIEW	BEL Sprint 10	20/Nov/18	27/Mar/19	Kamil Janeček	Phases: <ul style="list-style-type: none"> • derived column computation • feature extraction • user authentication wrapper • scalability evaluation wrapper 	'stepname_paramname' -> 'stepname_paramname' correct docstring		CLONE - Integration of data processing phases into pipeline
BEL-210	TO DO	BEL Sprint 9	12/Mar/19	27/Mar/19	Unassigned			<input checked="" type="checkbox"/>	Research about possibilities of leap motion 3D visualization
BEL-152	TO DO	BEL Sprint 7, BEL Sprint 9	20/Dec/18	26/Mar/19	Michal Manak				User authentication
BEL-220	TO DO	BEL Sprint 10	26/Mar/19	26/Mar/19	Matej Končál	https://tj.jupyter.org/en/latest/		<input checked="" type="checkbox"/>	Install jupyterhub on TP-VM
BEL-147	IN PROGRESS		20/Dec/18	26/Mar/19	Unassigned				Internal improvements
BEL-130	TO DO		10/Dec/18	26/Mar/19	Michal Manak	BEL-124			Production demo for end users
BEL-200	DONE		05/Mar/19	26/Mar/19	Unassigned	As a researcher I want to insert custom data to each payload in raw data so that grouping raw data by the custom data is simplified. Rationale: In an experiment involving navigation in an e-shop, `sessionID` gets reset on each page. We need to have a custom identifier that stays the same for each page.		<input checked="" type="checkbox"/>	Insert custom data to each payload in raw data
BEL-31	DONE		09/Oct/18	26/Mar/19	Kamil Burda				Visualization of raw data, events, preprocessed data and results
BEL-9	TO DO		07/Oct/18	26/Mar/19	Unassigned	As a researcher I want to log raw data from mobile devices on the web so that I can use the data for further analysis. Mobile devices = for now, smartphones and tablets Raw data to log: <ul style="list-style-type: none"> • touch screen <ul style="list-style-type: none"> ◦ touch size ◦ major and minor axis of touch area (touch major, touch minor) • sensors (except accelerometer, gyroscope) <ul style="list-style-type: none"> ◦ values ◦ timestamp Some of the sensors (or fields therein) may not be supported on all browsers/devices, this may help: <ul style="list-style-type: none"> • https://github.com/Modernizr/Modernizr References: <ul style="list-style-type: none"> • https://developer.mozilla.org/en-US/docs/Web/API/Touch_events/Using_Touch_Events 		<input checked="" type="checkbox"/>	Log additional raw data from mobile devices

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BEL-206	TO DO	BEL Sprint 10	06/Mar/19	26/Mar/19	Michaela Balážová	<p>As a researcher I want to visualize custom columns in one plot so that I could compare the columns or discover new patterns in data. Columns should be selectable from a list of columns available in the passed dataframe. I should be able to choose two views: movement data (x-y plot, e.g. mousy coordinates) or time series (timestamp-value, e.g. x-acceleration). Examples:</p> <ul style="list-style-type: none"> • mouse movement data before smoothing and after smoothing • x-velocity, y-velocity of touch data 	- jupyter-notebook with working examples as in desc.		Visualize custom columns
BEL-204	TO DO	BEL Sprint 10	06/Mar/19	26/Mar/19	Michaela Balážová	<p>As a researcher I want to be able to add background image to movement data so that I could better visualize the data in the given context. Example: Touch data logged from drawing patterns on a grid (the grid being the background).</p>	jupyter-notebook with working example		Add background image to movement data
BEL-199	TO DO	BEL Sprint 10	27/Feb/19	26/Mar/19	Tomáš Jendrejčák	<p>As a researcher I want to display EER in curves so that I could obtain the precise value of EER. This feature should apply to the following curves: FAR-FRR, DET.</p>	jupyter-notebook with working example		Display EER in curves
BEL-175	DONE	BEL Sprint 6, BEL Sprint 7	12/Feb/19	26/Mar/19	Kamil Janeček				BEL-151 / Create demo app server
BEL-218	DONE		19/Mar/19	26/Mar/19	Kamil Janeček	<p>Setup automatic deployment of demo application at /demo/server</p>	Demo application deployed to fastar vm using docker container		Demo app deployment
BEL-155	DONE	BEL Sprint 9	17/Jan/19	26/Mar/19	Michal Manak	<p>Add flow for:</p> <ul style="list-style-type: none"> • updating story in backlog which already has an estimate 			Update Jira methodology
BEL-209	DONE	BEL Sprint 9	12/Mar/19	26/Mar/19	Matej Končál	Refactor structure, naming and test in ML-Module.	Intuitive structure tree of module.		ML-Module refactor
BEL-148	DONE	BEL Sprint 7, BEL Sprint 9	20/Dec/18	26/Mar/19	Michaela Balážová	Plan demo execution.	<p>Stories for demo implementation Document containing more technical info about demo application.</p>		Create scenario for demo
BEL-35	DONE	BEL Sprint 7, BEL Sprint 8	09/Oct/18	26/Mar/19	Michaela Balážová	DET = detection error trade-off			Plot DET curve
BEL-202	DONE	BEL Sprint 9	05/Mar/19	26/Mar/19	Ján Vnenčák	<p>Start - only mouse down move - explode array and drop duplicates End - only mouse up</p>	Jupyter notebook with results		Post-process mobile data












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BEL-179	DONE	BEL Sprint 7, BEL Sprint 8	18/Feb/19	26/Mar/19	Michaela Balážová				BEL-35 / Create function for plotting DET curve
BEL-219	DONE	BEL Sprint 9	19/Mar/19	26/Mar/19	Ján Vnenčák				BEL-202 / Implement function to process touch data
BEL-183	DONE	BEL Sprint 9	19/Feb/19	26/Mar/19	Matúš Kalafut	As a researcher I want to visualize mobile data. Visualization should be interactive. Draw trajectory of touch data (discrete or not). Draw accelerometer and gyroscope data. Optionally scale touch points according to the touch force. On mouse hover show some data interactively about it. Canvas dimensions should be settable.			Visualize mobile data
BEL-211	DONE	BEL Sprint 9	12/Mar/19	26/Mar/19	Tomáš Jendrejčák	Our functions need to return same format. Either new column or whole dataframe. Decide which one and implement it in all functions.			Unify return values of ML module
BEL-213	DONE	BEL Sprint 9	13/Mar/19	26/Mar/19	Michal Manak				BEL-209 / Refactor names of functions
BEL-214	DONE	BEL Sprint 9	13/Mar/19	26/Mar/19	Michal Manak				BEL-209 / Refactor names of modules
BEL-185	DONE	BEL Sprint 7, BEL Sprint 9	19/Feb/19	25/Mar/19	Michaela Balážová	collect test data in demo application to compare mutiple users: - https://tp-fstar.gitlab.io/demo-app/			BEL-148 / Collect test data
BEL-215	DONE	BEL Sprint 9	15/Mar/19	25/Mar/19	Matej Končál				BEL-209 / Create ml-module readme
BEL-217	DONE	BEL Sprint 7, BEL Sprint 9	19/Mar/19	25/Mar/19	Ján Vnenčák	Add picture to existing demo from Jira BEL-186 to collect data. https://tp-fstar.gitlab.io/demo-app/			BEL-148 / Add picture to existing demo
BEL-161	DONE		17/Jan/19	19/Mar/19	Unassigned	A mouse has only one "input". Mobile devices have touch + multiple sensors, each representing a separate input. Leap Motion yields 3D coordinates for a multitude of points on hands (palm, wrist, fingertips, finger joints), each representing a separate input.	Computed columns are visible in table with raw data.		Make existing derived columns scalable w.r.t. number of inputs
BEL-186	DONE	BEL Sprint 7, BEL Sprint 9	19/Feb/19	19/Mar/19	Michaela Balážová				BEL-148 / Create pattern to draw

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BEL-212	DONE	BEL Sprint 9	12/Mar/19	19/Mar/19	Unassigned				Fix computation of magnitude columns
BEL-61	DONE	BEL Sprint 8	23/Oct/18	13/Mar/19	Matej Končál	<p>Mouse coordinates have two axes. Mobile sensors such as accelerometer and gyroscope have three axes. Leap Motion hand/finger positions have three axes. Each existing derived column has different requirements for scalability.</p> <ul style="list-style-type: none"> velocity, acceleration, jerk <ul style="list-style-type: none"> separate for each axis (x-velocity, y-velocity, ...) magnitude - combination of all possible axis tuples, starting from pairs (for three axes: xy, yz, xz, xyz) angular velocity - always requires exactly two axes, therefore only axis pairs are applicable (for three axes: xy, yz, xz) <p>Tangential velocity is therefore redundant since it is essentially velocity magnitude. Example function for velocity:</p> <pre>```calculate_column_combinations(data, velocity, prefix="velocity", columns=["x", "y", "z"], combinations="all")``` yields `velocity_x`, `velocity_y`, `velocity_z`, `velocity_x_y`, `velocity_x_z`, `velocity_y_z`, `velocity_x_y_z`.</pre> <p>Example for angular velocity:</p> <pre>```calculate_column_combinations(data, angular_velocity, prefix="angular_velocity_left_thumb", columns=["left_thumb_x", "left_thumb_y", "left_thumb_z"], combinations=[2])``` yields `angular_velocity_left_thumb_x_y`, `angular_velocity_left_thumb_x_z`, `angular_velocity_left_thumb_y_z`.</pre>	Computed columns are visible in table with raw data.		Make existing derived columns scalable w.r.t. number of axes
BEL-24	TO DO		09/Oct/18	12/Mar/19	Unassigned				Apply preprocessing methods to logged data during analysis
BEL-182	DONE	BEL Sprint 8	19/Feb/19	12/Mar/19	Michal Manak	<p>As a researcher I want to visualize mouse data. Visualization should be interactive. Draw trajectory of mouse data. On mouse hover show some data interactively about it. Canvas dimensions should be settable.</p>	Show sample		Visualize mouse data
BEL-12	DONE	BEL Sprint 8	07/Oct/18	12/Mar/19	Ján Vnenčák	<p>As a researcher I want to log metadata about the currently used device for browsing so that I can distinguish raw data from different devices. Fields:</p> <ul style="list-style-type: none"> OS, version, model 			Log device metadata
BEL-207	DONE	BEL Sprint 8	06/Mar/19	12/Mar/19	Ján Vnenčák				BEL-12 / Implement logger method to log device metadata
BEL-208	DONE	BEL Sprint 8	11/Mar/19	12/Mar/19	Michal Manak				BEL-182 / Visualize mouse data
BEL-196	DONE	BEL Sprint 8	26/Feb/19	11/Mar/19	Michal Manak	Find out what possibilities do we have. We need to log some unique id of device.			Possibilities of device unique ID

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BEL-119	TO DO		28/Nov/18	06/Mar/19	Unassigned	As a researcher, I want to experiment with behavioral biometric data interactively so that I can perform the analysis of behavioral biometric data more efficiently. Inspiration: <ul style="list-style-type: none">https://www.h2o.ai/products/h2o-driverless-ai/		🔗	Interactive Data Analysis
BEL-32	TO DO		09/Oct/18	06/Mar/19	Unassigned			🔗	Raw data visualization
BEL-205	TO DO		06/Mar/19	06/Mar/19	Unassigned	As a researcher I want to distinguish raw data by color according to the selected column so that I could discover similarities and differences in segments more effectively. Example: Visually distinguishing segments from multiple users by a column named `username` could help us find the movement similarities of the same user and differences among users.		📌	Distinguish raw data by color according to selected column
BEL-184	TO DO		19/Feb/19	06/Mar/19	Unassigned	As a researcher I want to visualize Leap Motion raw data so that I could better interpret the data. Use 3D scatterplot or linear plot to visualize the 3D coordinates. Allow to visualize only specific points - fingertips, palm etc. - to avoid cluttering the plot.		📌	Visualize Leap Motion data
BEL-203	TO DO		06/Mar/19	06/Mar/19	Unassigned	As a researcher I want to be able to replay the visualized data so that I could gain a better understanding of the user behavior. If feasible, provide two modes: <ul style="list-style-type: none">play automatically, allow pausing and stoppingprovide a slider to "move in time" Apply the replay functionality to all plots involving time - mouse/touch movements (despite not being shown on either axis), accelerometer, gyroscope, or any custom column.		📌	Replay visualized raw data
BEL-180	TO DO		19/Feb/19	06/Mar/19	Unassigned			📌	Visualize raw data online
BEL-141	TO DO		12/Dec/18	06/Mar/19	Unassigned	Basic features: <ul style="list-style-type: none">dwel timeflight time - all 4 variants		📌	Extract basic features from keystroke data
BEL-106	READY FOR REVIEW	BEL Sprint 6	15/Nov/18	05/Mar/19	Kamil Janeček			🔗	Technical debt - server module
BEL-193	DONE	BEL Sprint 8	26/Feb/19	05/Mar/19	Kamil Janeček	As a researcher, I want to get csvs from server with advanced filtering by inputs. with support of mongo query. endpoint: <ul style="list-style-type: none">csv/<device_type_prefix> e.g.<ul style="list-style-type: none">csv/mousecsv/accelerometercsv/gyroscopecsv/touchcsv/custom	Get logged data from each endpoint and show that they corresponds to	📌	Advanced data filtering
BEL-195	DONE	BEL Sprint 8	26/Feb/19	05/Mar/19	Matej Končál	Return only relevant columns for each inputs logged by logger. e.g. we dont want to have columns related to mouse in gyroscope data.	Downloaded data should be correct according to description.	🔗	BEL-193 / Return only relevant columns






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BEL-6	TO DO		06/Oct/18	05/Mar/19	Unassigned				 Log and store raw data and events from websites
BEL-178	DONE	BEL Sprint 7	18/Feb/19	04/Mar/19	Tomáš Jendrejčák				 BEL-34 / Create function for plotting ROC curve
BEL-34	DONE	BEL Sprint 7	09/Oct/18	04/Mar/19	Tomáš Jendrejčák	ROC = receiver operating characteristic			 Plot ROC curve
BEL-197	TO DO		27/Feb/19	27/Feb/19	Unassigned	<p>As a researcher I want to split samples per user rather than per class label so that the classifier does not potentially end up recognizing users rather than the class.</p> <p>Example: Recognition of age groups - children and adults During an experiment, we manually label the data with username and age group. To split extracted samples to train and test sets, we should select a group of users to exclude from the train test and include them in the test set. This corresponds to a real situation in which unknown users (= previously unseen by the model) must be properly recognized as either category. If samples from all users were included in both the train and test set, the model could potentially recognize the user rather than the category and would fail for unknown users.</p> <p>This feature should allow:</p> <ul style="list-style-type: none"> specifying any validation method (train-test split, 5-fold CV, ...) grouping according to any specified label (not just username) 		 Split samples per user rather than per class label	
BEL-90	TO DO		07/Nov/18	27/Feb/19	Unassigned	<p>As a researcher I want to tag extracted features so that I can better assess the appropriateness of each feature for specific goals of user modeling. Tags can help select relevant features and consequently improve recognition results. Example:</p> <ul style="list-style-type: none"> mean velocity - high observability (insecure, unsuitable for user authentication), good distinctiveness (for e.g. emotion recognition) start/end x, y - high consistency and distinctiveness for specific gestures (e.g. active authentication), barely usable for free movements (e.g. continuous authentication) <p>For each tag, each claim should be supported by providing links to relevant sources (journal articles, papers).</p>			 Tag extracted features
BEL-154	TO DO		17/Jan/19	27/Feb/19	Unassigned				 Apply advanced preprocessing methods to logged data during analysis
BEL-28	TO DO		09/Oct/18	27/Feb/19	Unassigned				 Simplify training and testing of user models for experiments
BEL-156	TO DO		17/Jan/19	26/Feb/19	Unassigned	<p>Columns to compute:</p> <ul style="list-style-type: none"> the columns specified in attachments angular acceleration angular jerk 			 Compute procedural angular columns
BEL-194	TO DO		26/Feb/19	26/Feb/19	Unassigned	zip			 Option to download data from each sensor in one package
BEL-192	READY FOR REVIEW		25/Feb/19	26/Feb/19	Ján Vnenčák				 Update logger module readme

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BEL-109	IN PROGRESS	BEL Sprint 6	15/Nov/18	25/Feb/19	Kamil Janeček	docstrings readme			BEL-106 / Documentation
BEL-151	DONE	BEL Sprint 6, BEL Sprint 7	20/Dec/18	25/Feb/19	Kamil Janeček				Store data for user authentication
BEL-177	DONE	BEL Sprint 6, BEL Sprint 7	13/Feb/19	25/Feb/19	Matúš Kalafut	Create endpoint that will return username for given session id			BEL-151 / Endpoint to get username from session ID
BEL-166	DONE	BEL Sprint 6, BEL Sprint 7	23/Jan/19	25/Feb/19	Matej Končál	Add custom data (sent in request) to session entry in DB.			BEL-151 / Add arbitrary data to session information
BEL-191	DONE		25/Feb/19	25/Feb/19	Kamil Janeček			<input checked="" type="checkbox"/>	Implement sensors error handling
BEL-170	DONE	BEL Sprint 6, BEL Sprint 7	23/Jan/19	24/Feb/19	Matej Končál	Request - Session id, username. Take model trained for user with given name and predict user with data from given session id.			BEL-151 / Endpoint for result of authentication
BEL-149	DONE	BEL Sprint 6, BEL Sprint 7	20/Dec/18	24/Feb/19	Ján Vnenčák				Technical debt - logger module
BEL-174	DONE	BEL Sprint 6, BEL Sprint 7	10/Feb/19	24/Feb/19	Kamil Janeček				BEL-149 / Sensors logging refactor
BEL-169	DONE	BEL Sprint 6, BEL Sprint 7	23/Jan/19	22/Feb/19	Matej Končál	Request will contain user name. Server should train model for user with given name and save it to DB			BEL-151 / Endpoint for model training
BEL-108	DONE	BEL Sprint 6	15/Nov/18	22/Feb/19	Kamil Janeček	atleast move docker-compose files to separate folder https://gitlab.com/tp-fastar/server			BEL-106 / Repository structure
BEL-144	DONE	BEL Sprint 6, BEL Sprint 7	20/Dec/18	22/Feb/19	Matej Končál	Create NPM module for logger-web Create pip package (setup.py) for ml-module			Modules packaging

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BEL-145	DONE	BEL Sprint 6, BEL Sprint 7	20/Dec/18	21/Feb/19	Kamil Janeček				 BEL-144 / Logger package
BEL-189	TO DO		21/Feb/19	21/Feb/19	Unassigned	As a researcher I want to log raw data from Leap Motion with maximum precision so that I could obtain more accurate data to work with. The current logger used by students-researchers are Unity scripts reading the data on each `update()` cycle. Since typically Unity apps have a limited FPS and Leap can have FPS as high as 100 depending on the configuration, we need to implement the logger as a standalone application running in the background.			Log raw data from Leap Motion with maximum precision
BEL-188	TO DO		21/Feb/19	21/Feb/19	Unassigned	As a researcher I want to select a list of features to extract from raw data so that I could work with context-relevant features up front. context = goal of user modeling (authentication, emotion recognition, ...), experiment (environment, tasks, application, ...) Rationale: motivate researchers to carefully analyze the logged data instead of blindly extracting all implemented features.			Select a list of features to extract from raw data
BEL-153	DONE		20/Dec/18	20/Feb/19	Ján Vnenčák			<input checked="" type="checkbox"/>	Send remaining data on session end
BEL-187	TO DO	BEL Sprint 6	19/Feb/19	19/Feb/19	Unassigned	Application version in container can't be obtained from env variable - thats overridable.			BEL-106 / Hard copy version number during build
BEL-102	DONE		13/Nov/18	19/Feb/19	Unassigned	As users of our product, we want to see our product in action.			Create demo implementation of authentication process
BEL-150	DONE	BEL Sprint 6	20/Dec/18	19/Feb/19	Unassigned	As an experiment participant, I want raw data to be collected for use in user authentication.			Collect data for user authentication
BEL-168	DONE	BEL Sprint 6	23/Jan/19	19/Feb/19	Ján Vnenčák				BEL-150 / Create web app
BEL-181	TO DO		19/Feb/19	19/Feb/19	Unassigned				Visualize raw data and segments on the fly
BEL-176	DONE	BEL Sprint 6, BEL Sprint 7	12/Feb/19	19/Feb/19	Kamil Janeček				BEL-149 / Update readme file
BEL-146	DONE	BEL Sprint 6, BEL Sprint 7	20/Dec/18	18/Feb/19	Kamil Janeček				BEL-144 / ml-module package
BEL-162	DONE	BEL Sprint 6	19/Jan/19	18/Feb/19	Matej Končál				Technical debt - ml module

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BEL-164	DONE	BEL Sprint 6	19/Jan/19	18/Feb/19	Kamil Janeček				BEL-162 / Refactor naming schemes
BEL-163	DONE	BEL Sprint 6	19/Jan/19	18/Feb/19	Kamil Janeček				BEL-162 / Docker files cleanup
BEL-11	DONE	BEL Sprint 5	07/Oct/18	12/Feb/19	Ján Vnenčák	As a researcher I want to be able to set the frequency of logging of individual sensors in order to preserve website performance while logging. If chosen frequency exceeds device frequency, keep all data.	Logged data visible on server for various frequency settings		Allow to choose frequency of logging from mobile devices
BEL-142	DONE	BEL Sprint 5	19/Dec/18	12/Feb/19	Kamil Janeček				BEL-11 / Implement sensors frequency limiter
BEL-105	TO DO	BEL Sprint 6	15/Nov/18	11/Feb/19	Matej Končál	http://flask.pocoo.org/docs/1.0/logging/			BEL-106 / Implement logging in server module
BEL-111	TO DO	BEL Sprint 6	19/Nov/18	11/Feb/19	Unassigned				BEL-106 / Error handling
BEL-173	DONE	BEL Sprint 6, BEL Sprint 7	10/Feb/19	10/Feb/19	Kamil Janeček				BEL-149 / Touch events logging refactor
BEL-172	DONE	BEL Sprint 6, BEL Sprint 7	09/Feb/19	10/Feb/19	Kamil Janeček				BEL-149 / Module structure refactor
BEL-165	DONE	BEL Sprint 6	23/Jan/19	03/Feb/19	Kamil Janeček				BEL-150 / Add possibility of adding custom data when initializing session
BEL-167	DONE	BEL Sprint 6	23/Jan/19	03/Feb/19	Kamil Janeček	1. Init 2. Start logging 3. End logging 4. Terminate session			BEL-150 / Create interface in logger

Key	Status	Sprint	Created	Updated	Assignee	Description	Acceptance criteria	T	Summary
BEL-171	DONE	BEL Sprint 6	30/Jan/19	01/Feb/19	Unassigned	<p>Hello,</p> <p>Action may be required to prevent your Let's Encrypt certificate renewals from breaking.</p> <p>If you already received a similar e-mail, this one contains updated information.</p> <p>Your Let's Encrypt client used ACME TLS-SNI-01 domain validation to issue a certificate in the past 60 days. Below is a list of names and IP addresses validated (max of one per account):</p> <p>team04-18.studenti.fiit.stuba.sk (147.175.149.219) on 2018-12-01</p> <p>TLS-SNI-01 validation is reaching end-of-life. It will stop working temporarily on February 13th, 2019, and permanently on March 13th, 2019. Any certificates issued before then will continue to work for 90 days after their issuance date.</p> <p>You need to update your ACME client to use an alternative validation method (HTTP-01, DNS-01 or TLS-ALPN-01) before this date or your certificate renewals will break and existing certificates will start to expire.</p> <p>Our staging environment already has TLS-SNI-01 disabled, so if you'd like to test whether your system will work after February 13, you can run against staging: https://letsencrypt.org/docs/staging-environment/</p> <p>If you're a Certbot user, you can find more information here: https://community.letsencrypt.org/t/how-to-stop-using-tls-sni-01-with-certbot/83210</p> <p>Our forum has many threads on this topic. Please search to see if your question has been answered, then open a new thread if it has not: https://community.letsencrypt.org/</p> <p>For more information about the TLS-SNI-01 end-of-life please see our API announcement: https://community.letsencrypt.org/t/february-13-2019-end-of-life-for-all-tls-sni-01-validation-support/74209</p> <p>Thank you,</p> <p>Let's Encrypt Staff</p>		<input checked="" type="checkbox"/>	Action required: Let's Encrypt certificate renewals
BEL-128	DONE	BEL Sprint 6	06/Dec/18	24/Jan/19	Unassigned			<input checked="" type="checkbox"/>	Docker-compose - add networks

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BEL-113	DONE	BEL Sprint 4, BEL Sprint 5	20/Nov/18	23/Jan/19	Ján Vnenčák	<p>As a researcher I want to log raw data from mobile devices on the web so that I can use the data for further analysis.</p> <p>Mobile devices = for now, smartphones and tablets</p> <p>Raw data to log:</p> <ul style="list-style-type: none"> touch screen <ul style="list-style-type: none"> touch coordinates (x, y) timestamp (as precise as possible) touch pressure (only one of these fields returns valid values, depending on the device) touch events - start, end, move touch identifier sensors (accelerometer, gyroscope) <ul style="list-style-type: none"> values (acceleration on x, y, z in m/s², orientation on x, y, z in degrees) timestamp <p>Need to solve infinite data stream from sensors !</p> <p>Some of the sensors (or fields therein) may not be supported on all browsers/devices, this may help:</p> <ul style="list-style-type: none"> https://github.com/Modernizr/Modernizr <p>References:</p> <ul style="list-style-type: none"> https://developer.mozilla.org/en-US/docs/Web/API/Touch_events/Using_Touch_Events 	Show raw data in console		Log raw data from mobile devices
BEL-121	DONE	BEL Sprint 4, BEL Sprint 5	02/Dec/18	23/Jan/19	Kamil Janeček	<p>Implementation of touch, accelerometer and gyroscope events logging</p> <p>deviceorientation: https://w3c.github.io/deviceorientation/</p> <p>https://stackoverflow.com/questions/4378435/how-to-access-accelerometer-gyroscope-data-from-javascript</p> <p>test: https://whatwebcando.today/device-motion.html</p>			BEL-113 / Implement mobile events logging
BEL-103	TO DO		13/Nov/18	17/Jan/19	Unassigned				Extract features from frequency domain
BEL-138	TO DO		12/Dec/18	17/Jan/19	Unassigned	<p>As a researcher, I want to log keystroke data from a PC keyboard on the web so that I can analyze keystroke dynamics for the purpose of active user authentication.</p> <p>Raw data:</p> <ul style="list-style-type: none"> timestamp key event type - key press (down) or key release (up) active modifier key(s) (e.g. ctrl, shift) <ul style="list-style-type: none"> for a comprehensive list, see https://en.wikipedia.org/wiki/Modifier_key ...anything else? <p>N.B.: Logging and sending actual keys over the network could pose legal problems. Key logging should be performed for experimental purposes only.</p>			Log keystroke data from PC keyboard on the web
BEL-140	TO DO		12/Dec/18	17/Jan/19	Unassigned	<p>As a researcher, I want to log keystroke data from mobile devices on the web so that I can analyze keystroke dynamics for the purpose of active user authentication.</p> <p>Raw data: the same keystroke raw data as for PC keyboards.</p>			Log keystroke data from virtual keyboard from mobile devices on the web

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BEL-159	TO DO		17/Jan/19	17/Jan/19	Unassigned	<p>Advanced features:</p> <ul style="list-style-type: none"> consider sequences of n successive key strokes (n-grams, I think?) consider different groups of keys (control keys, space, letters, numbers, special characters, ...) consider removal of keys (e.g. due to correction) 			Extract advanced features from keystroke data
BEL-160	TO DO		17/Jan/19	17/Jan/19	Unassigned	<p>On mobile devices, we can gain much more information for keystroke dynamics due to the presence of touch screen and sensors. Columns:</p> <ul style="list-style-type: none"> x- and y-offset from the center of a key on the keyboard, all existing columns before/during/after a key press. <p>In the future it is expected that the offset computation will be applicable to any element in the application beside buttons representing keys.</p>			Extract features from keystroke data specific for mobile devices
BEL-139	TO DO		12/Dec/18	17/Jan/19	Unassigned	<p>As a researcher I want to log and analyze keystroke data so that I can experiment with user models using keystroke dynamics.</p>			Provide support for logging and analyzing keystroke data
BEL-158	TO DO		17/Jan/19	17/Jan/19	Unassigned	The features are specified in the attachments.			Extract mouse click-related features
BEL-157	TO DO		17/Jan/19	17/Jan/19	Unassigned	The features are specified in the attachments.			Extract holistic movement features
BEL-117	TO DO		27/Nov/18	17/Jan/19	Unassigned	<p>Examples: difference in velocity, acceleration Exceeding a specified threshold should result in a new segment. What if the column value oscillates around the threshold?</p>			Split raw data to segments by difference in values of specified column(s)
BEL-104	TO DO		14/Nov/18	17/Jan/19	Unassigned	<p>To achieve ultimate flexibility in splitting data to segments, pass a hierarchical structure (e.g. lists of lists) to the segment split function. This very likely replaces feature extraction from parts of a single segment.</p>			Specify hierarchy of criteria to split data to segments
BEL-30	DONE	BEL Sprint 4, BEL Sprint 5	09/Oct/18	15/Jan/19	Michal Manak	<p>As a researcher I want to be able to assess the metrics for classification results w.r.t. the number of users in the model so that I can determine the scalability of the behavioral biometric user model. Example: Suppose I have data from 1000 users, I want to compute the accuracy of user identification for 5, 10, 20, 50, ... up to 1000 users. If the identification accuracy drops below e.g. 90% at 100 users, I can proclaim that my method is not usable for identification on the web for UX purposes for that many users.</p>	DataFrame containing metrics for each provided setting		Scalability of user model w.r.t. number of users
BEL-118	DONE		27/Nov/18	20/Dec/18	Unassigned	<p>server -identifikuje sa session -stranka bude posielat eventy -ked stranka da pokyn ze su data vyzbierane, server bude vediet get a natrenovat -model ulozit a zo stranky prijmat data a klasifikovat</p> <p>stranka - dalsia aplikacia (2 mody - zbieranie, test: 2 fazy) - vymysliet scenar</p> <p>ML module - package</p>			Create survey about demo architecture possibilities

Key	Status	Sprint	Created	Updated	Assignee	Description	Acceptance criteria	T	Summary
BEL-124	DONE	BEL Sprint 5	04/Dec/18	20/Dec/18	Matúš Kalafut	Plan demo execution.	Stories for demo implementation Document containing more technical info about demo application.		Create scenario for demo
BEL-89	DONE	BEL Sprint 4	07/Nov/18	20/Dec/18	Matej Končál	Phases: <ul style="list-style-type: none"> derived column computation feature extraction user authentication wrapper 	Dataframe containing needed values. Calculated metrics from them.		Integration of data processing phases into pipeline
BEL-143	DONE	BEL Sprint 5	19/Dec/18	20/Dec/18	Unassigned				BEL-124 / Create document with use cases
BEL-123	DONE	BEL Sprint 4, BEL Sprint 5	03/Dec/18	20/Dec/18	Matúš Kalafut				BEL-30 / Function for scalability results
BEL-62	DONE	BEL Sprint 5	23/Oct/18	20/Dec/18	Michal Manak	Examples of split criteria: <ul style="list-style-type: none"> explicit events - for touch screen, all data between touch-down and touch-up form one segment (define start and end criteria by defining values of desired rows) 	Dataframe containing segment id		Apply predefined criteria for splitting raw data to segments
BEL-131	DONE	BEL Sprint 5	11/Dec/18	20/Dec/18	Tomáš Jendřejčák	Create function that will split data to segments by custom defined start & end condition. 2 parameters - kwargs of begin row elements, kwargs of end row elements, time, time before, after Start of segment is defined by row that contains values as in first parameter (start row). End of segment is defined by row that contains values as in second parameter (end row).			BEL-62 / Create function for custom segment splitting
BEL-126	DONE	BEL Sprint 5	04/Dec/18	15/Dec/18	Michal Manak	Create and prepare presentation for MTS.			Presentation for MTS
BEL-125	DONE	BEL Sprint 5	04/Dec/18	15/Dec/18	Michaela Balážová	Prepare documentation for final submission.			Documentation - WS final
BEL-116	DONE	BEL Sprint 4	27/Nov/18	13/Dec/18	Kamil Janeček	Create class/function, which accepts list of callable object and executes them. Pipeline also accepts parameters for this objects and set them to object before execution.			BEL-89 / Create pipeline for callable object execution
BEL-115	DONE	BEL Sprint 4	26/Nov/18	13/Dec/18	Matej Končál	function in ml-module - authentication_metrics should return dataframe with 5 columns: <ul style="list-style-type: none"> user_train (id) real value (y_test) predicted (y_pred) probability 0 probability 1 			BEL-89 / Change implementation of authentication function

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BEL-36	DONE	BEL Sprint 4	09/Oct/18	13/Dec/18	Tomáš Jendrejčák	<p>x axis - classifier threshold y axis - FAR curve, FRR curve, EER (intersection of FAR and FRR)</p> <p>This plot only applies to classifiers yielding a continuous value on the output (probability, distance, etc.).</p> <p>If the threshold variable has a finite number of possible values, calculate FAR and FRR for each threshold value.</p> <p>Otherwise, select an interval to choose threshold values from and calculate FAR and FRR. If there is no threshold for which FAR = FRR, calculate EER from the two adjacent points where the FAR becomes greater than FRR or vice versa.</p>	Plot per each user		Plot curves for FAR, FRR and EER
BEL-122	DONE	BEL Sprint 4	03/Dec/18	13/Dec/18	Michal Manak				BEL-36 / Create function for plotting FAR, FRR and EER
BEL-137	DONE	BEL Sprint 5	11/Dec/18	13/Dec/18	Ján Vnenčák				BEL-125 / Add info about session request to product docu
BEL-134	DONE	BEL Sprint 5	11/Dec/18	13/Dec/18	Ján Vnenčák				BEL-125 / Specify fields in data format - logger module In product documentation
BEL-132	DONE	BEL Sprint 5	11/Dec/18	13/Dec/18	Michal Manak				BEL-125 / Specify generation of technical documentation in "Dokumentácia"
BEL-135	DONE	BEL Sprint 5	11/Dec/18	13/Dec/18	Matúš Kalafut				BEL-125 / Modify big picture - more specific
BEL-133	DONE	BEL Sprint 5	11/Dec/18	12/Dec/18	Kamil Janeček				BEL-126 / Code review slide
BEL-129	TO DO		06/Dec/18	06/Dec/18	Unassigned	<p>As a researcher I want to classify sequences of samples so that I can potentially improve classification results.</p> <p>Normally, we classify a single sample at a time, i.e. sequence length = 1. Sequence of samples could be defined as:</p> <ul style="list-style-type: none"> • n consecutive samples • consecutive samples per specified time interval <p>To combine the classified results to a single result, use:</p> <ul style="list-style-type: none"> • majority voting for discrete labels • weighted sum for probabilities <p>While binary classifiers are fairly easy to handle, multi-class probabilistic classifiers may very well not be a cakewalk.</p>			Classify sequences of samples
BEL-120	DONE		28/Nov/18	04/Dec/18	Matej Končál	https://gitlab.com/tp-fastar/webpage/blob/master/.gitlab-ci.yml		<input checked="" type="checkbox"/>	Investigate & fix webpage deployment
BEL-101	DONE	BEL Sprint 3	12/Nov/18	03/Dec/18	Michal Manak	Create pipeline which trains classifier for each user in dataset and return metrics for each user. Subsequently compute statistics from this metrics, e.g. average values, ...			BEL-29 / Create pipeline for user authentication evaluation
BEL-85	DONE	BEL Sprint 4	06/Nov/18	30/Nov/18	Michaela Balážová				Documentation













Key	Status	Sprint	Created	Updated	Assignee	Description	Acceptance criteria	T	Summary
BEL-10	DONE		07/Oct/18	27/Nov/18	Unassigned	As a researcher, I want to be able to easily select which sensors from mobile devices are logged from a website so that I can obtain relevant data up front and potentially prevent degradation of the website performance.			Allow to choose sensors to log from mobile devices
BEL-83	DONE	BEL Sprint 3	06/Nov/18	27/Nov/18	Ján Vnenčák	Analyse possibilities of logging data from mobile devices sensors. Output should be stories in backlog with adequate description. document sensors not working ..			Survey of logging possibilities from mobile devices
BEL-96	DONE	BEL Sprint 4	12/Nov/18	27/Nov/18	Michal Manak	Should contain: <ul style="list-style-type: none"> description of our project our goals <ul style="list-style-type: none"> what we want to achieve in our project big picture <ul style="list-style-type: none"> architecture description of every module technical documentation 	Documentation contains all described parts		BEL-85 / Documentation of software engineering project
BEL-95	DONE	BEL Sprint 4	12/Nov/18	27/Nov/18	Michal Manak	Should contain: <ul style="list-style-type: none"> team members and their assigned roles methodologies completed sprints <ul style="list-style-type: none"> summarizations, retrospectives exports from JIRA 	Documentation contain all described parts		BEL-85 / Project management documentation
BEL-99	DONE	BEL Sprint 3	12/Nov/18	20/Nov/18	Matej Končál	Write estimator which accepts Classifier in params. If I call fit on this transformer, it will train this classifier. Output of predict function will return actual class labels and predicted class labels for each sample. no data balancing by default (should be optional)			BEL-29 / Write estimator which wraps classifier
BEL-86	DONE	BEL Sprint 3	07/Nov/18	20/Nov/18	Unassigned	Should accept sessionId to get dataset for selected session			BEL-84 / Expose endpoint for data retrieval
BEL-110	DONE	BEL Sprint 6	16/Nov/18	20/Nov/18	Unassigned	https://gitlab.com/help/user/project/security_dashboard https://gitlab.com/help/ci/examples/sast.md e.g.: https://gitlab.com/tp-fastar/server/pipelines/36906104/security			BEL-106 / Add SAST checking
BEL-27	DONE	BEL Sprint 3	09/Oct/18	20/Nov/18	Kamil Burda	<ul style="list-style-type: none"> For each segment <ul style="list-style-type: none"> average min max median lower quartile upper quartile Inter quartile range Calculate those features also for parts (beginning, middle, end) of segment (Defined by count of points - events, custom choosing) Calculate duration, distance, start and end x,y, trajectory length 	Dataframe containing user_id, session_id, segment and all new columns.		Extract features from segments

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BEL-78	DONE	BEL Sprint 3	05/Nov/18	20/Nov/18	Kamil Burda	As a researcher I want to integrate external csv files to required format Suggestion: create function that will transform given data to DataFrame with specified labels (time, x, y .. as we require)	Dataset in required form (columns - time, x, y, id_user)	<input checked="" type="checkbox"/>	Adjust data to required format
BEL-84	DONE	BEL Sprint 3	06/Nov/18	20/Nov/18	Kamil Burda	As a researcher, I want to export data from server to csv file, so that I can use it for further processing.	Downloadable csv from our server	<input checked="" type="checkbox"/>	Generate dataset from our data
BEL-29	DONE	BEL Sprint 3	09/Oct/18	20/Nov/18	Kamil Burda	Usually, for n users from an experiment, user authentication is computed as follows: <ul style="list-style-type: none"> For each user: <ul style="list-style-type: none"> make user the owner (positive class), the others impostors (negative class) train model (binary classifier, anomaly detector) test model report metrics from all users <ul style="list-style-type: none"> metrics for each user individually statistics - average, std. Metrics <ul style="list-style-type: none"> "typical" metrics for binary classifiers: accuracy, precision, recall, F1-score domain-specific: FAR, FRR, EER User should be able to choose the reported metrics 	FP, FN rate for each user mean, std and median for those metrics per user	<input checked="" type="checkbox"/>	User authentication
BEL-79	DONE	BEL Sprint 3	06/Nov/18	20/Nov/18	Kamil Burda	Compute additional columns (see picture in attachments) for data	Computed columns are visible in table with raw data.	<input checked="" type="checkbox"/>	Compute speed related columns from raw data
BEL-72	DONE	BEL Sprint 3	02/Nov/18	20/Nov/18	Ján Vnenčák	Please stop building library into repository. Artifacts are available from CI. https://docs.gitlab.com/ee/user/project/pipelines/job_artifacts.html#downloading-the-latest-artifacts Please state this information in readme.	built lib removed from repo master version of demo deployed on gitlab-pages	<input checked="" type="checkbox"/>	Change demo implementation
BEL-112	DONE	BEL Sprint 3	19/Nov/18	20/Nov/18	Michal Manak	Calculate metrics FAR, FRR, EER		<input type="checkbox"/>	BEL-29 / Add functions to compute domain specific metrics
BEL-100	DONE	BEL Sprint 3	12/Nov/18	20/Nov/18	Matej Končál	Write function which computes metrics. This function accepts actual class labels and predicted class labels as input.		<input type="checkbox"/>	BEL-29 / Add function for metrics calculation
BEL-98	DONE	BEL Sprint 3	12/Nov/18	20/Nov/18	Tomáš Jendrejčák	Write transformer which could be used in Pipeline and accepts <i>user_id</i> as parameter. Output of this transformer will contain label column, which represents if row belongs (1) /not belongs (0) to user with <i>user_id</i> passed in parameter.		<input type="checkbox"/>	BEL-29 / Write transformer which adds label column for user
BEL-97	DONE	BEL Sprint 3	12/Nov/18	20/Nov/18	Michal Manak	Function should transform data column name to name that we require for ml module.		<input type="checkbox"/>	BEL-78 / Create function for data column name preprocess





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BEL-93	DONE	BEL Sprint 3	10/Nov/18	20/Nov/18	Matej Končál	<p>Write function to compute features for each segment</p> <ul style="list-style-type: none"> • average • min • max • median • lower quartile • upper quartile • inter quartile range • duration • start x • start y • end x • end y <p>Matej Končál suggest to use pandas.groupby.agg. Make groupby general, so i can change groupby column name and compute features e.g. for segment parts</p>		BEL-27 / Compute features for each segment	
BEL-94	DONE	BEL Sprint 3	10/Nov/18	20/Nov/18	Tomáš Jendrejčák	<p>Write functions which accepts data from one segment/part of segment and compute:</p> <ul style="list-style-type: none"> • trajectory length • air distance from start to end 		BEL-27 / Compute movement length for segment	
BEL-92	DONE	BEL Sprint 3	10/Nov/18	20/Nov/18	Matúš Kalafut	<p>Write function to split each segments to 3 parts (maybe more, if there is easy solution):</p> <ul style="list-style-type: none"> • beginning - e.g. identifier <seg_num>_b • middle - e.g. identifier <seg_num>_m • end - e.g. identifier <seg_num>_e <p>Make function general, so it must be easy to change split criterion, e.g. split criterion will be passed to function via parameter</p>		BEL-27 / Split segments to parts	
BEL-88	DONE	BEL Sprint 3	07/Nov/18	19/Nov/18	Matúš Kalafut	<p>Implement data conversion from structure stored in database into CSV format.</p>		BEL-84 / Implement data conversion	
BEL-91	DONE	BEL Sprint 3	07/Nov/18	17/Nov/18	Kamil Janeček	<p>Currently we are storing this:</p> <pre> { "sessionId": 24, "timeStamp": 2580.599999986589, "eventType": "CUSTOM", "payload": {dynamic}, "sessionStartsAt": 154118820776 } </pre> <p>That dynamic part is problematic for us. We need to know all of those possible columns before we can start doing any processing.</p>	<p>For given mongo query find all possible keys in json.</p>	BEL-84 / Find all possible columns	
BEL-107	TO DO	BEL Sprint 6	15/Nov/18	15/Nov/18	Unassigned	<p>https://gitlab.com/tp-fastar/server/blob/develop/behameetrics/util.py#L10</p>		BEL-106 / Improve logger detection	
BEL-87	DONE	BEL Sprint 3	07/Nov/18	07/Nov/18	Matej Končál	<p>get correct column names for CSV export</p> <p>relates to BEL-78</p>		BEL-84 / Finalize data format	

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BEL-56	DONE	BEL Sprint 2	23/Oct/18	06/Nov/18	Kamil Janeček	As a researcher I want to store logged data per session, so that I can see the data per session.	User is able to get data from session, identified by session id (shown on logger page)		Integrate logger with server
BEL-52	DONE	BEL Sprint 2	16/Oct/18	06/Nov/18	Ján Vnenčák	<ul style="list-style-type: none"> Logger should log also combinations of mouse clicks (all 5 mouse buttons) Log scroll amount (horizontal, vertical) 	On scroll event, data should contain 2 properties for vertical and horizontal scroll amount delta. Mouse button property should contain all mouse click combinations.		Log Mouse Clicks - Advanced
BEL-8	DONE	BEL Sprint 2	06/Oct/18	06/Nov/18	Kamil Burda	As a researcher I want to specify custom events to be logged so that I can enhance pre-processing of raw data. Events could be defined in the code. Examples: clicking or moving through a specific object The number of fields to be logged is variable. At the minimum, the name of the event should be logged (could be anything). Logging custom events on the web should be possible on any device.	Logger should contain textfield and confirm button. After inserting custom event into textfield and button click the custom event is logged with all other attributes.		Log Custom Events
BEL-25	DONE	BEL Sprint 2	09/Oct/18	06/Nov/18	Kamil Burda	Compute additional columns (see picture in attachments) for data	Computed columns are visible in table with raw data.		Compute speed related columns from raw data
BEL-26	DONE	BEL Sprint 2	09/Oct/18	06/Nov/18	Kamil Burda	Data should be tagged by segment according to its time interval, silence time, or combination of both. Criteria should be maximally variable.	User is able to get data by session with segments criteria (time intervals - silence, combination)		Split raw data to time interval and silence segments
BEL-75	DONE	BEL Sprint 2	02/Nov/18	06/Nov/18	Michal Manak	Create jupyter notebook <ul style="list-style-type: none"> 1. load raw_logs.csv 2. demonstrate usage of functions implemented in BEL-25 and BEL-26 			Prepare jupyter notebook for demo
BEL-77	DONE	BEL Sprint 2	05/Nov/18	05/Nov/18	Michal Manak	Allow user to programatically log custom events: these events will have structure defined in issue BEL-74			BEL-8 / Interface for custom events
BEL-63	DONE	BEL Sprint 2	23/Oct/18	05/Nov/18	Kamil Janeček				BEL-52 / Advanced mouse clicks implementation
BEL-73	DONE	BEL Sprint 2	02/Nov/18	05/Nov/18	Kamil Janeček				BEL-56 / Use session ID in logged data
BEL-65	DONE	BEL Sprint 2	25/Oct/18	05/Nov/18	Kamil Janeček	Configure gunicorn to run flask app, when deployed to production/develop			BEL-56 / Serve flask with gunicorn in production
BEL-76	DONE	BEL Sprint 2	03/Nov/18	05/Nov/18	Matúš Kalafut	http://flask.pocoo.org/docs/1.0/api/#flask.Flask.before_request validate custom header before every request 			BEL-56 / Validate clients header

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BEL-66	DONE	BEL Sprint 2	27/Oct/18	04/Nov/18	Kamil Janeček				BEL-56 / Posting logged data to server
BEL-58	DONE	BEL Sprint 2	23/Oct/18	04/Nov/18	Matej Končál				BEL-56 / Filter session data on server
BEL-57	DONE	BEL Sprint 2	23/Oct/18	03/Nov/18	Matej Končál				BEL-56 / UID generation
BEL-60	DONE	BEL Sprint 2	23/Oct/18	03/Nov/18	Unassigned	ideas: document per session event = meta + payload			BEL-56 / Model events in database
BEL-59	DONE	BEL Sprint 2	23/Oct/18	03/Nov/18	Unassigned				BEL-56 / Save session id in events
BEL-64	DONE	BEL Sprint 2	25/Oct/18	02/Nov/18	Kamil Janeček	<ul style="list-style-type: none"> fix docker image creation job - cache from latest-dev image when branch develop replace '_' with '-' in docker container name 			BEL-56 / Server CI/CD refactor
BEL-74	DONE	BEL Sprint 2	02/Nov/18	02/Nov/18	Kamil Janeček	Define data structure for custom events (all events)	Specified data structure		BEL-8 / Define data structure
BEL-13	DONE		07/Oct/18	23/Oct/18	Unassigned	<p>As a researcher I want to log information about the current session so that I can distinguish raw data from multiple sessions.</p> <p>Fields:</p> <ul style="list-style-type: none"> session identifier user identifier 			Log Session Metadata
BEL-53	DONE		16/Oct/18	23/Oct/18	Unassigned	<p>As a researcher I want to log user ID during experiments so that I can distinguish data from multiple participants</p> <p>How should we determine the user ID?</p>			Log User ID
BEL-20	DONE		08/Oct/18	23/Oct/18	Unassigned				Project kickoff
BEL-23	DONE	BEL Sprint 1	09/Oct/18	23/Oct/18	Kamil Burda	<p>As a researcher I want to store logged data from the web so that I can later analyze the data at any given time.</p> <ul style="list-style-type: none"> display stored data technologies 	test of saving data (example input - json) and display correct data on retrieval		Store Logged Data
BEL-54	DONE	BEL Sprint 1	21/Oct/18	23/Oct/18	Kamil Janeček	setup deployment /run docker container/ setup nginx	current develop branch deployed to VM		BEL-23 / Deploy develop to VM
BEL-47	DONE	BEL Sprint 1	09/Oct/18	22/Oct/18	Michal Manak				BEL-17 / Product deployment methodology

Key	Status	Sprint	Created	Updated	Assignee	Description	Acceptance criteria	T	Summary
BEL-21	DONE	BEL Sprint 1	08/Oct/18	22/Oct/18	Michal Manak	Create methodologies for code writing	Defined methodologies for code writing approved by all team members		BEL-17 / Methodology for code writing
BEL-39	DONE	BEL Sprint 1	09/Oct/18	22/Oct/18	Matúš Kalafut				BEL-17 / Methodology for code review
BEL-43	DONE	BEL Sprint 1	09/Oct/18	22/Oct/18	Michaela Balážová	Save data to database.			BEL-23 / Integrate server with database
BEL-22	DONE	BEL Sprint 1	08/Oct/18	22/Oct/18	Matúš Kalafut	Create methodologies for version control	Defined methodologies for version control approved by all team members		BEL-17 / Methodology for version control
BEL-42	DONE	BEL Sprint 1	09/Oct/18	22/Oct/18	Michaela Balážová	Select backend technology (language, framework) for server. Expose endpoints for: 1. saving data 2. retrieving data Setup repository + CI (dockerize) + auto deploy to our VM			BEL-23 / Backend server
BEL-38	DONE	BEL Sprint 1	09/Oct/18	22/Oct/18	Michal Manak	https://team04-18.studenti.fiit.stuba.sk/wiki/display/BEH/Big+picture			Big picture
BEL-55	DONE	BEL Sprint 1	22/Oct/18	22/Oct/18	Michal Manak	<ul style="list-style-type: none"> goals for this semester <ul style="list-style-type: none"> what needs to be done in the end of winter semester (approximately 17.12.) visions for the next semester 			BEL-38 / Define goals of our project
BEL-46	DONE	BEL Sprint 1	09/Oct/18	22/Oct/18	Michal Manak				BEL-38 / High-level product architecture
BEL-49	DONE	BEL Sprint 1	09/Oct/18	21/Oct/18	Kamil Janeček				BEL-17 / Definition of ready
BEL-48	DONE	BEL Sprint 1	09/Oct/18	21/Oct/18	Michal Manak				BEL-17 / Definition of done
BEL-19	DONE		08/Oct/18	21/Oct/18	Tomáš Jendrejčák				Team setup
BEL-40	DONE	BEL Sprint 1	09/Oct/18	21/Oct/18	Kamil Janeček	https://team04-18.studenti.fiit.stuba.sk/wiki/display/BEH/Documentation			BEL-17 / Methodologies for documentation

Key	Status	Sprint	Created	Updated	Assignee	Description	Acceptance criteria	T	Summary
BEL-7	DONE	BEL Sprint 1	06/Oct/18	16/Oct/18	Kamil Burda	<p>As a researcher I want to log raw data from computer mice on the web so that I can use the data for further analysis.</p> <p>Data to log:</p> <ul style="list-style-type: none"> • log name of the event + generic data (x, y, timestamp) • coordinates (x, y) • timestamp - as precise as possible • event type - move, click (left, middle, right, ...), scroll, ... <ul style="list-style-type: none"> ◦ in case of clicks, distinguish mouse-down and mouse-up <p>Additional comments:</p> <ul style="list-style-type: none"> • browser and version compatibility - not really sure, as many as possible, I guess <ul style="list-style-type: none"> ◦ chrome- latest ◦ firefox- latest • performance concerns - not important at the moment <p>References:</p> <ul style="list-style-type: none"> • https://developer.mozilla.org/en-US/docs/Web/API/MouseEvent/buttons • https://developer.mozilla.org/en-US/docs/Web/Events/wheel 	List of log events in console		Log Mouse Raw Data
BEL-16	DONE		08/Oct/18	15/Oct/18	Ján Vnenčák	<p>Website minimum requirements:</p> <ul style="list-style-type: none"> • team name • information about teammates • project plan • current state of plan • teammates roles • links to documentation and meetings records • all interesting things connected with the project and the project workflow 	Webpage meets all the minimum requirements. Webpage is available on team04-18.studenti.fiit.stuba.sk.		BEL-19 / Webpage
BEL-5	DONE		06/Oct/18	15/Oct/18	Matej Končál	setup CI for current server deployment	Test		BEL-1 / Current server deployment
BEL-44	DONE	BEL Sprint 1	09/Oct/18	14/Oct/18	Kamil Janeček	Method/observable which will return required data: timestamp, x, y, eventName			BEL-7 / Logging functionality
BEL-45	DONE	BEL Sprint 1	09/Oct/18	14/Oct/18	Ján Vnenčák	<p>Verify logging component in</p> <p>firefox: latest</p> <p>chrome: latest</p> <ul style="list-style-type: none"> ▪ > write all output to console 			BEL-7 / Verify logging
BEL-51	DONE		13/Oct/18	14/Oct/18	Michal Manak	Characters with diacritics are not consistent with other characters. Change it.	Characters with diacritic are consistent with other characters		BEL-19 / Font webpage
BEL-41	DONE	BEL Sprint 1	09/Oct/18	12/Oct/18	Kamil Janeček	Setup MongoDB on our VM. (docker container, secured instance, start on startup)			BEL-23 / Configure database system

Key	Status	Sprint	Created	Updated	Assignee	Description	Acceptance criteria	T	Summary
BEL-14	DONE		08/Oct/18	09/Oct/18	Michaela Balážová	<p>Assign roles to everyone in team:</p> <ul style="list-style-type: none"> • scrum master - Michal Manak • documentation - Michaela Balážová • code quality (code review, review of created tests) - Kamil Janeček • frontend - Ján Vnenčák • server admin - Matej Končál • testing - Tomáš Jendrejčák • implementation - Matúš Kalafut <p>Discuss and figure out (later, during project) how to assign another roles like developer, versioning, backend ...</p>	Every team member has assigned role		BEL-19 / Assign roles
BEL-15	DONE		08/Oct/18	08/Oct/18	Michaela Balážová	<p>create logo of our team</p> <p>https://logomakr.com/6z0HoX</p> <p>https://team04-18.studenti.fiit.stuba.sk/wiki/display/BEH/Team+identity</p>	created logo of team		BEL-19 / Team logo
BEL-2	DONE		02/Oct/18	06/Oct/18	Kamil Janeček	<p>Cakame na ramku:</p> <p>https://tfs.fiit.stuba.sk:8443/tfs/StudentsProjects/TP%20Virtual%20Machines/_workitems?id=8857</p> <p>Vyzera, ze to vie rozumne bezat z dockeru:</p> <p>https://hub.docker.com/r/atlassian/confluence-server/</p>			BEL-1 / Confluence
BEL-3	DONE		02/Oct/18	02/Oct/18	Matej Končál	<p>Dufam, ze let's encrypt pojde aj ked nemame vlastnictvo domeny.</p> <p>Nahodit do nginxu.</p>			BEL-1 / TLS