

Git Changelog

PFM (23-03-31)

Features

- "Base Properties" item in actor editor is now hidden for components that have no base properties ([58ad221](#))
- actor bones now show in viewport when hovering over a body part ([254a3c2](#))
- actor property values are now initialized from project after main component initialization and before entity spawn ([e6d9b8d](#))
- add "OnChannelAdded" and "OnChannelRemoved" callbacks for animation manager ([3028942](#))
- add "Save as Copy" menu bar option ([14219d1](#))
- add additional tooltip information to actor editor constraint icons ([2e721f8](#))
- add additional version information ([c04a956](#))
- add AnimationManager::FindAnimation for finding/creating the animation of a specific actor ([b500690](#))
- add axis lines to translation gizmo ([19ce11d](#))
- add bloom component action for viewing scene bloom ([a4bc32e](#))
- add context menu option to jump to target property for property references in actor editor ([7ffe128](#))
- add context-menu option for going to driver properties of constraints in actor editor ([75a804a](#))
- add feedback messages when shader kernels are being built ([5f9db8f](#))
- add film clip context menu options for editing film clip properties ([d2162bb](#))
- add gui.PFMViewport:ScaleSelectedActors ([d84df2a](#))
- add hover text for selected bone in viewport ([9674035](#))
- add interactive skeleton visualization ([235e50c](#))
- add menu option to convert scenebuild of current project to map ([de73ba9](#))
- add menu option to start lua debugger server ([bd6e21e](#))

- add meta type information for transform properties of pfm_actor component ([23bd079](#))
- add model explorer option to convert model from/to ascii/binary format ([162f983](#))
- add mouse hover selection outline effect ([8a5754b](#))
- add option to create "child_of" constraint through actor editor ([10d4a8d](#))
- add option to remove drivers and constraints via icon in actor editor ([4bebe88](#))
- add outline effect component ([3ea6fe5](#))
- add PFMTreeViewElement:AddUniquelcon and :ClearIcons ([70bcef9](#))
- add saving / loading to ik rig editor ([7348c27](#))
- add support for property reference component property types ([49805d2](#))
- add support for read-only component properties in actor editor ([1456594](#))
- add support for very large render resolutions ([0ea820c](#))
- add tiled rendering for pragma renderer ([0f19281](#))
- add tutorial system ([a35ca15](#))
- add update-checker ([8d965e4](#))
- add utility functions and identifiers for tutorial system ([6030ef5](#))
- add vr_manager component (wip) ([b411791](#))
- add world axis gizmo ([52ba356](#))
- adding a constraint or math expression now automatically adds a single-value animation channel if one doesn't exist ([c44eadc](#))
- all logging categories are now enabled by default if log parameter is not specified ([ba01a4d](#))
- animation drivers can now be created through actor editor ([eb05de4](#))
- **anim:** bones can now be selected by clicking a triangle weighted to that bone ([1416fbb](#))
- **anim:** non-selected IK bones can now be directly clicked and moved in viewport ([ea6f8d5](#))
- **anim:** selected bones are now highlighted ([b465641](#))
- apply changes for Silverlan/pragma@e6e7bb59 ([ab4cfcd](#))
- **asset,gui:** add missing gui material files for detaching windows ([a353b92](#))
- bones in actor editor are now displayed in hierarchical order ([ca59b1c](#))
- camera settings are now saved and restored to/from projects ([132c05d](#))
- change implementation of util_transform component to allow usage in secondary scenes/viewports ([df35060](#))
- component lists in actor editor now use localized component names ([569e80c](#))
- component properties with a single animation value can now be edited directly outside of graph editor ([caca401](#))

- components in actor editor are now listed directly below actors instead of "components" sub-item ([703fa63](#))
- converting map to actors now takes scale into account ([e0e5d9a](#))
- copying the property path of a property now includes the full path including actor id ([d41ff17](#))
- current project file name is now displayed in window title bar ([363e53d](#))
- **dev:** add option to assign actor component to x / y variable via right-click context menu in actor editor if developer mode is enabled ([3a22890](#))
- disable bloom for transform gizmos ([58e4438](#))
- disable motion editor button ([3e8f00f](#))
- **ecs:** add option to specify ik rig from file for ik_solver component ([ad57536](#))
- **ecs:** add pfm_project_manager component for creating PFM scenes outside of PFM ([f43f679](#))
- **ecs:** remove ik_solver component ([5f7fc65](#))
- emission_factor for cycles pbr shader can now be used without emission texture ([3e156cd](#))
- enum-based component properties no longer list "Count" as an option in actor editor ([6f9f12f](#))
- **gui:** add ik rig editor ([8d5dffc](#))
- **gui:** add option to add simple non-editable text properties to control menus ([6c1c3e5](#))
- hide render options not supported by selected renderer ([2edcc14](#))
- ik rig editor updates and improvements ([0b92277](#))
- **ik:** add ik components (wip) ([a63e07f](#))
- **ik:** increase precision of ik solver ([90d4081](#))
- implement changes for Silverlan/pragma@0c91c31c ([4668b27](#))
- importing asset into model explorer now gives an option to import as collection or as single model ([55b0565](#))
- importing assets via model explorer now imports into sub-directory ([e32e3ee](#))
- improve skeletal bone visualization in viewport ([0315c90](#))
- **locale:** add ik rig editor localizations ([758c199](#))
- **locale:** add Japanese translation ([2c9fa7b](#))
- **locale:** add localization for components and component properties in actor editor ([cfc0579](#))
- **locale:** add missing localizations ([9115eec](#))
- **locale:** add missing localizations ([a464a92](#))
- **locale:** update localizations ([dfde1a8](#))

- math expression window now gives immediate feedback about validity of expression ([88cfd5d](#))
- model browser now automatically refreshes after importing assets ([9de100f](#))
- moving actor between collections is now instantaneous ([50c2ff8](#))
- PFM projects can now be marked as read-only ([0e423a5](#))
- pfm projects can now be saved/loaded in ascii format ([4647fc2](#))
- pfm_actor component now also adds origin component ([a6793d8](#))
- placing an actor through the model catalog now assigns the model name to the actor's name ([f71b3f3](#))
- properties in actor editor now only display the base name of the property instead of the full name ([d31eb26](#))
- remove origin component from pfm_actor component ([e8f2679](#))
- rename "track_to" constraint to "look_at" (see Silverlan/pragma@da75b3f6) ([aab83b5](#))
- replace selection wireframe with outline effect ([d0fb7f5](#))
- selecting an actor in the viewport now automatically scrolls to it in the actor editor ([c5e5363](#))
- sfm projects can now be imported from directories other than "elements/sessions/" ([f41b93c](#))
- **shaders:** add missing particle shader files ([d786f7e](#))
- tutorial layout changes ([7c4e058](#))
- UDM editor now has options for creating new UDM files, importing UDM data or saving as new file ([1789cce](#))
- various actor editor additions ([74ac3b7](#))
- various ik rig editor additions and improvements ([3019232](#))
- various tutorial system improvements ([c0c97e9](#))
- version info can now be clicked to copy it to clipboard ([1ad002f](#))
- **vr:** vr manager now automatically creates actors for all recognized tracked devices ([1add829](#))

Bug Fixes

- add missing include ([2d00d50](#))
- constraint menu no longer shows up for string-based properties ([73fcbc5](#))
- debug objects are now longer included in renders when using Pragma renderer ([edbdf52](#))
- fix "Save As" not updating internal file name to new file name ([e529ab0](#))
- fix ascii-based models not appearing in model explorer ([fda5dcd](#))

- fix clicking mesh not detecting correct weighted bone properly ([864004e](#))
- fix component property values of type 'entity' not getting saved/loaded properly to/from a PFM project ([68ca36c](#))
- fix device type settings in render options being inverted ([fc4f53d](#))
- fix gui.PFMTreeViewElement:SetIdentifier not registering identifier with parent ([3f18518](#))
- fix importing map not importing prop_dynamic entities ([a446d9c](#))
- fix incorrect class name for pfm_project_manager component ([1dfd98c](#))
- fix light sources not showing up in secondary viewports ([8118eb8](#))
- fix low-resolution preview render image ([c0f888d](#))
- fix lua error when auto-saving ([0e818e4](#))
- fix lua error when baking lightmaps ([84a714c](#))
- fix lua error when changing component property values ([1b55a9f](#))
- fix lua error when changing property values ([7d7492a](#))
- fix lua error when clicking ik handle in viewport ([25c38e2](#))
- fix Lua error when launching PFM ([5baf87d](#))
- fix Lua error when moving actor to empty collection ([b71a946](#))
- fix lua error when rendering if opencv module is not installed ([ab71e1e](#))
- fix lua errors ([8bec2e8](#))
- fix lua errors if actor is spawned with unknown component types ([8bf3ff3](#))
- fix Lua errors in ik rig editor ([deb7eb2](#))
- fix lua errors when adding or removing constraints ([70dddfe](#))
- fix potential crash when selecting or de-selecting spot-light actor ([a3bc308](#))
- fix quick-ik in actor editor not working properly ([68a190b](#))
- fix removing pfm_skeleton component not removing visual bones ([3ceb0c9](#))
- fix some items in actor editor tree having incorrect identifier assigned to them ([1288805](#))
- **ik:** fix broken ik behavior for actors without the pfm_model component ([8ed45f6](#))
- **locale:** fix changing language not being saved ([e997b2d](#))
- resolve issue where actor editor component icons would disappear in some cases ([f2bd880](#))
- resolve issue where actor editor component property list would not get reloaded when component properties change ([a81095c](#))
- resolve issue where camera projection matrix would not be reset properly after tiled rendering ([aebe5c8](#))
- resolve issue where clicking constraint icon in actor editor would not select associated property properly ([1226112](#))

- resolve issue where incorrect slider step size would be used for slider UI elements ([988bea9](#))
- resolve issue where removing an actor could result in corrupted actor references ([6f9ad31](#))
- resolve issue where sky actor would appear with error texture ([5ba11fc](#))
- resolve issue where transform gizmo arrows would not transform in correct space ([41b7ee3](#))
- resolve issue with actor model being initialized too late, causing dependent component property values to not be initialized properly ([fa03294](#))
- resolve various issues caused by filmmaker being initialized before game is ready ([d690b82](#))
- resolve various issues related to transform gizmo ([1667afe](#))

Pragma (23-03-31)

Features

- "scale" keyvalue for prop and transform components now accepts vector values ([755e0cd](#))
- add additional error reporting if model loading or importing fails ([e0853ac](#))
- add base editor UI element identifiers ([2fc6c4d](#))
- add bloom component properties ([56042d1](#))
- add console commands log_level_console and log_level_file for changing log levels on the fly ([8a6becd](#))
- add error handling when saving a model ([cd7524d](#))
- add functions for getting parent pose of transform-based component properties ([e4c108b](#))
- add git sha to version information ([7b34f3c](#))
- add global string table ([6f67c6a](#))
- add gltf import support for multiple mesh instantiations ([b70ee2a](#))
- add gui.WIBaseEditor:GetContentsElement ([31c18be](#))
- add logging messages for lightmap system ([6d7813e](#))

- add missing log_file launch parameter ([15c0e4c](#))
- add model flag for indicating if model is world geometry ([75930c4](#))
- add Model::RemoveUnusedMaterialReferences ([91bfd95](#))
- add new logging system ([7d8c965](#))
- add on-complete callback to util.import_assets ([1ab7ffd](#))
- add option to calculate projection matrix for tiled rendering ([d862e63](#))
- add ostream overloads for entity reference types ([10554e5](#))
- add support for importing gltf scene as map with multiple models ([802061e](#))
- add support for Lua development and debugging with Visual Studio Code ([405dabf](#))
- add udm lua bindings ([b66c082](#))
- add udm.BaseSchemaType:ReloadUdmData ([43357c3](#))
- add util::generate_two_pass_gaussian_blur_coefficients ([f1c9c92](#))
- add util::to_image_buffer overload for providing a pre-existing staging image ([00397a6](#))
- add WorldData Lua bindings ([68eaa49](#))
- **anim:** add multi-threading for animations ([36029e2](#))
- **anim:** implement constraint influences ([ec65ae4](#))
- **asset:** add skybox materials ([11fa969](#))
- **asset:** replace toolsnodraw texture ([3b18acc](#))
- code cleanup ([e4ad13f](#))
- debug_aim_info command now attempts bhv raycast before physics raycast ([6c27acb](#))
- **debug:** add info.txt to crashdump ([955642d](#))
- **debug:** add logging information ([74977af](#))
- **debug:** crash dump now includes vendor information about all available GPUs on system ([772db85](#))
- **debug:** crashdump now includes device id for available GPU devices ([44fde2e](#))
- **debug:** re-enable crashdump exception information ([b49bdaf](#))
- **ecs,animation:** add animation constraint system ([e628639](#))
- **ecs,lua:** add option to specify type meta data as well as custom setters and getters for Lua-based component properties ([8222143](#))
- **ecs,lua:** lua-based component properties using the PoseTypeMetaData type meta data are now automatically associated with respective pos/rot/scale properties ([0c91c31](#))
- **ecs:** add "pose" property to ik solver component ([07b37ee](#))
- **ecs:** add BaseBVHComponent::GetVertex ([a62a322](#))
- **ecs:** add child_of constraint component ([679f76e](#))
- **ecs:** add component property meta type data ([fed2d66](#))

- **ecs:** add component property parent meta type ([2d8f34f](#))
- **ecs:** add constraint component events when driver or driven object has changed ([88301a7](#))
- **ecs:** add constraint entity component types ([1410021](#))
- **ecs:** add event callback when clearing material overrides for model component ([904fa93](#))
- **ecs:** add ik_solver component ([a69e632](#))
- **ecs:** add methods for retrieving coordinate-based component properties in specific coordinate space ([b26c539](#))
- **ecs:** add origin entity component ([e9b5029](#))
- **ecs:** add pose type meta data for associated pose properties with pos/rot/scale properties ([8b24818](#))
- **ecs:** add property component member type ([5bde6fc](#))
- **ecs:** add read-only member property flag ([a08a204](#))
- **ecs:** add track_to constraint component ([06001d5](#))
- **ecs:** BaseGenericComponent::EVENT_ON_MEMBERS_CHANGED now includes event data struct with component information ([23f75d9](#))
- **ecs:** implement constraints: limit_location, limit_rotation, limit_scale ([34a3b26](#))
- **ecs:** improve performance of composite component ([08aaacb](#))
- **ecs:** rework and rename track_to constraint to look_at constraint ([da75b3f](#))
- emission_factor material property can now be used without emission map ([39fa66c](#))
- Engine::AddTickEvent is now thread-safe ([c00bd5d](#))
- entity model bodygroups are no longer reset on spawn ([16c1177](#))
- **ExprTk:** update to version 0.0.2 ([e354bb2](#))
- force panima animations to always update, even if timestamp hasn't changed ([6f23fb2](#))
- **gui, lua:** add gui.ScrollContainer:GetWrapperElement, :ScrollToElement* functions ([4156f14](#))
- **gui:** add option to disable automatic rendering when setting scene for WIViewport GUI element ([21c9131](#))
- **gui:** add option to disable menu item ([489659b](#))
- **ik:** add full-body ik system ([8455946](#))
- improve bloom effect ([17c4e54](#))
- improve lightmap quality ([1cfd4d2](#))
- **lad:** add math alias definitions to meta lua documentation ([810844b](#))
- **lad:** add math alias definitions to meta lua documentation ([fd4b7b5](#))
- **lad:** update lua meta documentation files ([d1326d9](#))

- lightmap data cache component now initializes data cache automatically ([6bdbe84](#))
- **locale:** add debug logging messages ([bd52a4a](#))
- **locale:** add Japanese translation ([ee424f3](#))
- **locale:** add localization for components and component properties ([b6b1d40](#))
- **locale:** update localizations ([31767f6](#))
- log system improvements ([79a12ff](#))
- loggers are now flushed whenever error or critical messages are printed ([6cfcb81](#))
- **log:** info messages now have the "[info]" prefix if printed using the logging system ([9113847](#))
- **log:** warning, error and critical messages are now completely colored in ([baede6a](#))
- lua-based shaders no longer re-initialize material descriptor set when it is not necessary to do so ([c199a10](#))
- **lua,ecs:** add component property reference bindings ([228dab7](#))
- **lua:** add console.invoke_change_callbacks binding ([c568ec2](#))
- **lua:** add constraint function bindings ([727389f](#))
- **lua:** add ents.AnimatedBvhComponent:RebuildAnimatedBvh binding ([dc377f4](#))
- **lua:** add ents.AnimatedComponent:GetEffectiveBoneTransforms binding ([d53c570](#))
- **lua:** add ents.EntityComponent:InvokeElementMemberChangeCallback binding ([6af95ce](#))
- **lua:** add ents.is_member_type_animatable binding ([51a2271](#))
- **lua:** add ents.parse_uri and ents.create_uri bindings ([d69df6f](#))
- **lua:** add equality operator for prosper.Window objects ([3365a0a](#))
- **lua:** add game.is_game_initialized, game.is_game_ready, game.is_map_initialized ([f3744d7](#))
- **lua:** add gui.get_element_under_cursor overload with base element parameter ([2589c61](#))
- **lua:** add ik rig lua bindings ([5b7735d](#))
- **lua:** add Lua bindings for log library ([c536f87](#))
- **lua:** add math.Transform constructor with ScaledTransform argument ([c3ef7ed](#))
- **lua:** add missing entity component type meta data bindings ([e655387](#))
- **lua:** add model, physics and misc bindings ([807dc8c](#))
- **lua:** add options for custom push constants and material data initialization for Lua-based shaders ([03c9f4c](#))
- **lua:** add panima function bindings for merging channels and animations ([521991c](#))
- **lua:** add panima.Channel:TestValueExpression ([8705de2](#))
- **lua:** add parameter to asset.import_model and asset.import_gltf for importing model as collection or single model ([2038c26](#))

- **lua:** add prosper.Window:GetWindowTitle ([9c91196](#))
- **lua:** add string.snake_case_to_camel_case and string.camel_case_to_snake_case bindings ([273feb0](#))
- **lua:** add support for displaying object types when debugging with lua-debug ([e5a474b](#)), closes [/github.com/actboy168/lua-debug/issues/237#issuecomment-1477469263](#)
- **lua:** add support for displaying object values when debugging with lua-debug ([2451782](#))
- **lua:** add udm.is_convertible binding ([9535e18](#))
- **lua:** add util.ImageBuffer:Insert bindings ([7cc2ff8](#))
- **lua:** ents.Entity:FindMemberInfo now also returns component reference ([8018ad9](#))
- **lua:** rename ik.Solver:RemoveDragControl to ik.Solver:RemoveControl ([9f498d7](#))
- map format can now contain entity component data ([de913ce](#))
- performance improvements ([71fb75c](#))
- reduce weight of directional light sources when calculating dominant light direction ([b935e2b](#))
- remove ambient color from shader render settings and add camera fov ([e6e7bb5](#))
- update intel vtune path references to version 2023.0.0 ([812e0f7](#))
- update panima submodule ([04c72ec](#))
- update sharedutils submodule ([7d0e338](#))
- update sharedutils submodule ([048f8a4](#))
- update sharedutils submodule ([8476465](#))
- update util_image submodule ([8b48504](#))
- various animation driver updates and improvements ([80953a8](#))
- **windows:** change console font to "Ubuntu Mono" ([f290627](#))

Bug Fixes

- add missing include ([c16c6d1](#))
- add missing origin component source code files ([c1ad5eb](#))
- changing collisions of a physics constraint having no effect ([e76ac98](#))
- clang compile error ([b147489](#))
- crash when doing mouse or keyboard input before main window has been created ([4855962](#))
- **ecs:** add missing component property registration for bone pose property of animated component ([edb3798](#))
- **ecs:** fix enabling or disabling axis for child-of constraint not having any effect ([362dbed](#))

- **ecs:** fix Lua errors in lua_script component ([343ec34](#))
- **ecs:** fix lua errors when loading lua_script entity component ([a32a0d4](#))
- **ecs:** fix space constraint component axes being inverted by default ([83fae4a](#))
- **ecs:** resolve various ik_solver component issues ([9ab5716](#))
- **ecs:** resolve various ik_solver component issues ([5931047](#))
- fix "color" keyvalue for color component being interpreted incorrectly ([4a3faa4](#))
- fix "debug_hdr_bloom" console command not working properly ([a5ceec4](#))
- fix accessing invalid iterator when removing entity component from within OnRemove ([6c60c49](#))
- fix BaseEntityComponent::SetTransformMember* functions applying value incorrectly if value is in world space and property expects value to be in local space ([79a0a2c](#))
- fix build error ([9c5ff63](#))
- fix build error ([313436a](#))
- fix build error on latest Visual Studio version ([20b1ad8](#))
- fix clang compile error ([3b493af](#))
- fix ClickComponent.raycast not applying filter correctly to static entities ([cfbfa5b](#))
- fix component properties not being saved when saving map data ([2a91492](#))
- fix component property references not working if property path has multiple path components ([41bb680](#))
- fix crash when removing entity with panima component ([30e029e](#))
- fix importing gltf as model not applying mesh scaling correctly ([87cf3cc](#))
- fix importing gltf as multiple models resulting in invalid bodygroup references ([3993611](#))
- fix invalid memory read access ([8e2c045](#))
- fix limit location/rotation/scale components not working if no driver was specified ([17362ef](#))
- fix limit_distance component not working properly ([fcc60fb](#))
- fix memory corruption issue ([9dd303f](#))
- fix ModelSubMesh::SetVertexWeight using wrong vertex weight set ([3a30e1b](#))
- fix obsolete model path ([cb063d2](#))
- fix potential crash when loading a map ([19fa263](#))
- fix potential exception in BaseEntity::CreateMemberReference ([1ce36ac](#))
- fix potential null pointer access ([6ddb2c6](#))
- fix pragma::get_component_member_name_hash and pragma::get_normalized_component_member_name returning incorrect results ([d66af40](#))
- fix warning about missing static_bvh_cache component during map load ([82479eb](#))

- **gui:** fix file explorer adding additional slash to path if file is in root directory ([16f4def](#))
- **linux:** fix build errors due to missing std::format library ([5a25f4d](#))
- **linux:** resolve compile errors ([608da84](#))
- **log:** resolve various logging inconsistencies ([0682925](#))
- **lua,gui:** resolve issue where "OnTextChanged" callback would not work for "WIText" GUI elements ([ce84793](#))
- **lua:** add ents.create_entity_uri and ents.create_component_uri bindings ([1dfac80](#))
- **lua:** fix duplicate bound "tostring" method for entity components ([954323a](#))
- **lua:** fix ents.BhvComponent.HitInfo.entity not using correct lua object ([1ae8906](#))
- **lua:** fix ents.UniversalMemberReference:GetPath not returning correct path in some cases ([6bc89ff](#))
- **lua:** fix error when calling log.prefix ([e8203c3](#))
- **lua:** fix incorrect constness for some lua bindings ([7000a7f](#))
- **lua:** fix lua error when calling ents.UniversalComponentReference:GetComponentName ([12ba931](#))
- **lua:** fix module paths not being set up properly unless remote debugging is enabled for lua state ([7de40ff](#))
- **lua:** fix potential invalid memory access in util.generate_hair_data ([7ae2ffd](#))
- **lua:** fix type enums for ik rig constraints being bound with wrong class ([7ef9257](#))
- **lua:** implement missing features for transform component property type ([d40c88d](#))
- **lua:** resolve issue where udm GetValue functions would return nil if property is of type element ([5a211e8](#))
- **lua:** resolve issue where universal entity reference constructors would not accept uuid objects ([f7b35d6](#))
- **ModelSubMesh::GetVertexWeight** - resolve issue where incorrect vertex weight set would be used ([fff66d9](#))
- resolve compile errors ([6079768](#))
- resolve issue where console would not get initialized fully unless created at engine startup ([1165a97](#))
- resolve issue where crashdump would not generate properly ([a0df754](#))
- resolve issue where debug render objects could accumulate and not be flushed when no scenes are being rendered ([a9ba75e](#))
- resolve issue where entities in map generated from imported gltf would all have same uuid ([beca3c8](#))
- resolve issue where entity render buffer would not be initialized properly ([6b9e379](#))
- resolve issue where ik rigs could not be saved ([8500d0a](#))
- resolve issue where importing a model through the model explorer would fail ([e93b81c](#))

- resolve issue where lua source file could not be determined correctly ([4ccd7ce](#))
- resolve issue where Lua-script for Lua-based entity would not be loaded if invoked by creation of another Lua-based entity ([6feee4a](#))
- resolve issue where material and entity color factor would be interpreted as srgb instead of linear ([6cc1778](#))
- resolve issue where objects from imported gltf assets would have incorrect rotation ([656399a](#))
- resolve issue where panima components would not be updated properly if entity has no animated component ([85aaa9a](#))
- resolve issue where saving a model would not save the reference animation correctly ([be93859](#))
- resolve memory corruption issues ([7ed7018](#))
- resolve potential crash when multiple scenes with debug objects are rendered at the same time ([31527e2](#))
- resolve potential crash with animation drivers when using parameter references of properties with certain types ([3f34a22](#))
- temporarily disable multi-threading for animations ([524ad34](#))

Revision #2

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