NPC Script

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This is a declarative script language, using for programming algorithmes of NPCs. The main language units are the states and events.

The NPC programm have two type: *parametric*, *algorithic*.

The *Parametric* type using the basic parameters from config files and usign the default simple-moving alhorithm.

The *Algorithmic* type using the declarated events and states in special file. This allows to NPC using itself working schemes.

Contents

System states

The states, applyng by engine

_DEFAULT	Startup NPCs STATE

Physical states

The states, applyng automatily by physical environment, where currently placed NPC

_GROUND	NPC stay on ground
_AIR	NPC flying/falling in air
_UNDERWATER	NPC under water
_LAVA	NPC stay on block, marked "as lava"

System events

The events, what calling on game process events by engine

_ACTIVATE	NPC appeared on screen
_DEACTIVATE	NPC Deactivating, if it be offscreen 4 sec ago
_KILL_JUMP	Player jump to his head in flying state
_KILL_SLIDE_SLOPE	Player collided with NPC while he sliding on slope
_KILL_BY_NPC	Collided with NPC, what have option "HURT_NPC=TRUE"
_KILL_FIREBALL	Collided with NPC, marked as "fireball"
_KILL_ICEBALL	Collided with NPC, marked as "iceball"
_KILL_HAMMER	Collided with NPC, marked as "palyer's hammer"
_KILL_BOMB	Collided with bomb explosion zone (and Peach's bomb)
_KILL_BOOMERANG	Collided with NPC, marked as "boomerand"
_KILL_TAIL	Collided with player's sprite zone, placed in player's front, and have height=(player/2)
_KILL_SPIN	Player jump to his head in state "Spining"
_KILL_BY_SHOE	Player jump to his head with mounded items (Shoes, Yoshis, helicopter)
_WAS_EATEN	NPC was eaten by Yoshi
_ON_LAVA_COLLISION	NPC was contacted with block, marked as "lava"
_ON_CLIFF	He collided with cliff
_ON_DIE	He died
_ON_PLAYER_COLLISION	He collided with player
_ON_BLOCK_COLLISION	he collided with block
_ON_NPC_COLLISION	he collided with NPC
_ON_ANY_COLLISION	he collided with any objects
_ON_THROW	He did be thowed by player or by generator
_ON_PUT	He did be puted by player or by generator
_ON_TAKE	NPC did taked by player
_PHYSICAL_STATE_CHANGED	If was changed the physical changed: example, NPC falled to water from air

Language commands:

the user's comments in script

```
//comment
```

define state with name XXXX

```
STATE XXXX:
        <commands>
```

define event with name YYYY

```
EVENT YYYY:
        <commands>
```

Parametric:

set NPC's health as XX - default 1

```
SET_HEALTH XX
```

set acceleration value to ZZ, if value 0 - speed changing instance

```
SET_ACCELERATION ZZ
```

set speed in pixels per second

```
SET_SPEED ZZ
```

change plaing music by ID=YY

```
CHANGE_MUSIC YY
```

Play sound with ID=YY

```
PLAY_SOUND YY
```

Events and states:
NPC's state to state with name ZZZZ

CHANGE_STATE ZZZZ

Call to defined event with name XXXX

_CALL XXXX

All of NPC's:

Subtract the number with value=YY from NPCs health. If health <=0 - NPC was died

APPLY_DAMAGE YY

Transform NPC to NPC with ID value=YY

TRANSFORM_TO_NPC YY

Transform to NPC-container with ID=YY and put this NPC into him

PACKINTO_NPC YY

Kill packed NPC:

DESTROY_PACKED

Spawn other NPC with ID=YY

SPAWN YY

SPAWN YY TYPE DIRECTION SPEED

> Spawn NPC with ID=YY, with TYPE (PROJECTIVE, PUT),
> > direction (UP DOWN LEFT RIGTH TOPLAYER[350 25] 45)
> > with speed with value=SPEED

directions:

UP DOWN LEFT RIGTH FRONT REAR	static direction
TOPLAYER	ind player's center position and calculate direction
TOPBOTTOM	find player's bottom position and calculate direction
TOPLAYER[350 25]	find player's position and calculate direction params - corner gradus limits
45	static gradus direction, relative to NPC's h-front
RAND	Random without gradus limits
RAND[350 25]	set random direction in slected gradus range

start NPCs movement with speed fade (need to declare <u>acceleration</u>)

`DO_RUN`

Stop with speed fade (need to declare <u>acceleration</u>)

`DO_STOP`

Force deactivate NPC and return it on his start position

`DO_DEACTIVATE`

Jump UP NPC with vertical INERTIA SPEED

`JUMP YY`

Kill this NPC:

DIE

Define animations and graphics:

set static frame number XX (0-n frames on animated sprite)

`SET_C_FRAME XX`

set animation with framelist (example `[ 1 2 3 4 5 ]`) with loop.

`SET_ANIMATION [ framelist ] ANITYPE`

Where `ANITYPE` - is NPCs physical state:
`GROUND`, `AIR`, `UNDERWATER` or `ANY`

show non-loop animation with frame-delay value=YYY and set as static the last frame in defined framelist

`SET_F_FRAME [ framelist ] YYY`

set animation frame delay in milliseconds

`SET_FRAMESPEED ZZ`

Effects:

Start effect animation on NPCs position (dynamic effects will use his default settings)

`DO_EFFECT YY`

Start dynamic effect with defined properties

`DY_EFFECT YY POSITION DIR SPEED`

position:

   `CENTER`, `POS[ 12 44 ]` (relative at NPC's current position)

direction:

`LEFT RIGHT UP DOWN FRONT REAR`	static directions
`TO_PLAYER`	find player's center position and calculate direction
`TO_PBOTTOM`	find player's bottom position and calculate direction
`TO_PLAYER[ 350 25 ]`	find player's position and calculate direction params - corner gradus limits
`45`	static gradus direction, relative to NPC's h-front
`RAND`	Random without gradus limits
`RAND[ 350 25 ]`	set random direction in slected gradus range

You can use `TO_PLAYER`, `FRONT` or `TOPBOTTOM`, `FRONT` for spawn effect on NPC's FRONT
if collosion with player has not detected

Speed movement:

   Dynamic effect speed declaring in pixels per second

Modify player state: (Will be modified only with player, what collided with NPC)

Change Mounted objects on player:

`SET_MOUNTED XX YY`

XX – Mount type (0 – nothing, 1 – show, 2 – helicopter, 3 – horse/dinosaur)
YY – mounted object ID:
Shoes: 1-3
helicopters: 1-2
horses: 1-8

Change player's power-up state:

`SET_PLAYER_STATE XX`

XX – Player's state number: 1-7:
1 – small, 2 – big, 3 – fire, 4 – raccoon, 5 – tanooki, 6 – hammer, 7 - ice

Detectors

Detectors allow to call events on object detection

Set detector on current state (if current state was changed, detector will be disabled):

`SET_DETECTOR OBJECT DISTANCE XX DIRECT EVENT`

Object:

`BLOCK`	Detect block
`BLOCKID YY`	Detect block with ID value=YY
`PLAYER`	Detect playable characyer
`NPC`	Detect any NPC
`NPCID YY`	Detect NPC with ID value=YY
`BGO`	Detect any BGO
`BGOID YY`	Detect BGO with ID value=YY

Detection type:

`DISTANCE`	detect object on approximations by distance radius (square) value=XX
`DISTANCE_H`	detect object on horisontal approximations by distance value=XX
`DISTANCE_V`	detect object on vertical approximations by distance value=XX
`COLLISION`	detect object on collision with them

Detector directions:

`ANY`	Allow detect in all directions
`TOP`, `BOTTOM`, `FRONT`, `BACK`, `TOP_FRONT`, `TOP_BACK`, `BOTTOM_FRONT`, `BOTTOM_BACK`	Use direction limit for object detection

`EVENT`   - call global or user defined event if detector was passed

Conditional expressions:

Single:
```
IF [ expression ]
[
<commands>
]
```

Double: True/False actions:
```
IF [ expression ]
[
<commands>
]
ELSE
[
<commands>
]
```

Expressions:
Single:
```
[ VALUE op VALUE ]
```

Multi:
```
[ [ VALUE1 = VALUE2 ] && [ VALUE1 != VALUE3 ] ]
```

Operators:
```
=     >     <     >=     <=     !=
```

Logical (if you checking many expressions):
```
&&     ||
```

Timer:

The timer will run your commands after his timeout
set timer on YYY milliseconds

```
SET_TIMER YYY
[
<commands>
]
```

Looped timer with YYY delay

```
SET_TIMER_LOOP YYY
[
<commands>
]
```

Timer will reset, if state with defined timer, changed

NPCs Options:

change system NPCs options

SET_OPT OPTION YYY

Get current option value:

OPT_OPTION

Options table:

Option	Values	Description
HURT_PLAYER	TRUE/FALSE	NPC will hurt the player
HURT_NPC	TRUE/FALSE	NPC will hurt the other NPC
EATABLE	TRUE/FALSE	NPC can be eaten by Yoshi
SLIDE_SLOPE	TRUE/FALSE	NPC can be kicked on slope slide
JUMPED	TRUE/FALSE	NPC can be kicked on head-jump
DEACTIVATION	TRUE/FALSE	NPC will deactivate on off-screen 4 sec ago
KICKEDBYNPC	TRUE/FALSE	NPC can be kicked by other NPC
FIREBALL	TRUE/FALSE	NPC can be kicked on fire ball
ICEBALL	TRUE/FALSE	NPC can be freeze on ice ball
HAMMER	TRUE/FALSE	NPC can be kicked on hammer
ALLOW_TAIL	TRUE/FALSE	NPC can be kicked by tail
ALLOW_SPIN	TRUE/FALSE	NPC can be kicked on spin
ALLOW_SHOE	TRUE/FALSE	NPC can be kicked on mounted objects
CLIFF_DETECT	TRUE/FALSE	NPC will detect cliffs on movements
EFFECT	UNSIGNED INTEGER	Default "die" effect ID
SH_EFFECT	UNSIGNED INTEGER	Default "kicked" effect ID
SCORE	0-12	Give Score to player on kick NPC
GRAVITY	TRUE/FALSE	Enable/disable gravity
GRAB_SIDE	TRUE/FALSE	NPC can be grabbed on side
GRAB_TOP	TRUE/FALSE	NPC can be grabbed on top
GRAB_ANY	TRUE/FALSE	NPC can be grabbed on any collisions
TAKABLE	TRUE/FALSE	NPC can be takes by player
LAVA_PROT	TRUE/FALSE	NPC will not burn in lava
ADHESION	TRUE/FALSE	Allows to NPC walking on walls and on celling
D_HEALTH	UNSIGNED INTEGER	Default NPC's health
SPECIAL	INTEGER	Special option
CONTAINER	TRUE/FALSE	This NPC is – container. Special value is a containing NPC