Strategic Navigation

premeditated navigation

map = ({tactic abstraction},
{location abstraction}
)

combined navigation

route navigation   explorative navigation

route = < (tactic, location) >

Tactical Navigation

directional navigation   positional navigation   branching
in space   in space   in network of passages

location

Basic Behaviour

in space   in network of passages   searching

Basic Behaviour

basic behaviour in space

  follow course

  approach target

  dock at target

basic behaviour in network of passages

  follow passage

  follow wall

  approach target

  turn into passage

  turn into i-th passage

  stop

searching

  spiral searching

  block searching

  meandering

Tactical Navigation

directional navigation in space

  compass navigation

  dead reckoning

positional navigation in space

  landmark navigation

  celestial navigation

branching in network of passages

  binary branching

  rectangular branching

  directional branching

  n-way branching

  branching at marked junction

Strategic Navigation

route navigation

  homog. route navigation

  heterog. route navigation

explorative navigation

  path finding

  threading

combined navigation

  positional path finding

  traversing

  making a detour

  making a shortcut

premeditated navigation

  route map navigation

  map navigation

Basic Behaviour

basic behaviour in (enclosed or open) space

Title	*Percept*	*Representation*	*Action*
follow course	course; orientation	course (direction)	adjust orientation to course, steer clear of obstacles
approach target	remaining distance, view of target	distance	if remaining distance near Zero, switch to new behaviour
dock at target	position, orientation	target position (direction, distance), orientation at target	maneuver into target position and orientation

basic behaviour in network of passages (tunnels, corridors, roads, trails)

follow passage	walls, obstacles		follow passage centralized between walls, avoid obstacles
follow wall	wall, obstacles	{left | right}	follow wall, avoid obstacles
approach target	[remaining distance,] view of (marked) junction	[distance]	if remaining distance near Zero, switch to new behaviour
turn into passage	junction with {left | right} passage	{left | right}	turn {left | right} into resp. passage
turn into i-th passage	junction with n passages	i	turn into i-th passage
stop at target	walls, [dead end]	target position (direction, distance)	stop

searching

spiral searching	locality in space	characteristics of target location	spiral outwards until location is found
block searching	locality in rectangular grid of passages	characteristics of target location	search each block in vicinity by spiraling until location is found
meander–ing	locality in rectangular grid of passages	characteristics of target location	search in vicinity by meandering until location is found

Tactical Navigation

directional navigation in space

Title	*Percept*	*Representation*	*Action*
compass navigation	compass direction; orientation, elapsed time, speed	target position (direction, distance), orientation at target	compute course to target, remaining distance; follow course, approach target; change course into target orientation
dead reckoning	accumulated homing vector; direction	target position (direction, distance), orientation at target	compute course to target, remaining distance; follow course, approach target; change course into target orientation

positional navigation in space

landmark navigation	view of landmarks, orientation	location characterized by landmarks, orientation at target	triangulate vector to target, navigate directionally
celestial navigation	view of moving celestial bodies, orientation	location in absolute coordinate system, orientation at target	triangulate vector to target, navigate directionally

branching in network of passages

Title	Percept	Representation	Action
binary branching	passage with bifurcation	{left | right}	follow to bifurcation; follow {left | right} wall
rectangular branching	passage with crossing in rectangular grid	{left | straight | right}	follow to crossing; follow (straight) or turn into {left | right} passage
directional branching	passage with crossing in directional grid, direction	direction {N | E | S | W}	follow to crossing; follow (straight) or turn into {left | right} passage
n-way branching	passage with n-way junction	i	follow to junction; turn into i-th branch
branching at marked junction	passage with marked n-way junction	marked branch	follow to junction; turn into (marked) i-th branch

Strategic Navigation

route navigation

Title	*Percept*	*Representation*	*Action*
homog. route navigation	{locations}	tactic, sequence of (target location)	apply tactic to locations in sequence, til end of route; stop/dock at target
heterog. route navigation	{locations}	sequence of (tactic, target location)	(apply tactic to location) in sequence, til end of route

explorative navigation

path finding	enclosed or open space, possibly obstructed	target location	construct route: sequence of (tactic [for next passage towards target, possibly by making detours], intermediate location), until target is found

threading	labyrinth of passages	(characteristics of) target location	construct thread (inverse route): sequence of (inverse tactic [for next passage towards target], intermediate location) | backtrack using thread, until target is found

combined navigation

positional path finding	enclosed or open space, possibly obstructed	target location	combine positional navigation (e.g. landmark navigation using GPS) and path finding
traversing	enclosed or open space, possibly obstructed	target location	combine directional/positional navigation (e.g. dead-reckoning/landmark navigation) and explorative navigation around obstacles
making a detour	(temporarily) obstructed route	route	construct route via evasive location to target of obstructed route; navigate with alternative route
making a shortcut	"longer" route	route	construct "shorter/direct" route to target of "longer" route; navigate with alternative route

premeditated navigation

route map navigation	route marked on map, {locations}	sequence of (tactic abstraction, location abstraction) on map	construct route: sequence of (concretize: (tactic abstraction, location abstraction) -> (tactic, location)); navigate with route
map navigation	source, target location marked on map, {locations}	source, target location marked on map	construct route map by abstract navigation on map; navigate with route map