Pieces attacking a square of the enemy king shelter which is empty, on which there is a piece and a pawn
Attacking squares of the enemy king shelter which are empty, occupied by pieces or pawns should score different bonus points as there are differences in the efficiency of attack. The most efficient way of attacking is attacking empty squares, followed by attacking squares occupied by pieces and squares occupied by pawns. This is because enemy objects get in the way of attacking pieces.
1/8 higher value for attacking an empty square than attacking a square occupied by a piece
1/8 higher value in turn for attacking a square occupied by a piece than a square occupied by a pawn

Linear pieces attacking more than one squares of the enemy king shelter along the same line (diagonal, rank or file)
Squares attacked by linear pieces along the same line should score differently. 1/10 higher value for the square closest to the piece in relation to the next closest square, which in turn will score 1/10 higher than the next closest square, etc. This is because the possibility of intervention of enemy pieces along the ray of action of the attacking linear piece.

Attacking passers
Pieces attacking passers will score double points than when attacking a normal pawn. I think this is self-explanatory.

Rule for more than one linear pieces attacking objects
When more than one linear pieces attack objects (pawns and pieces) along the same line (a diagonal, file or rank) and are placed one after the other, the second piece (placed after the first) will score 1/7 lower points, and the third, if there is such, 1/7 lower than the second.

This rule will apply also to control of specific squares (in front of weak pawns, etc.).
It will concern too, importantly, attacking squares of the enemy king shelter.

Heavy pieces in terms of available squares on files and ranks
The ratio for available free squares on files and ranks for the heavy pieces will be measured.
+20cps for a split in the interval 50-50 to 55-45
+10cps for a split in the interval 55-45 to 60-40
When there are more than one heavy pieces on the board, the ratio will be measured for all pieces as a whole, so that one of the pieces may prevail on files, while other on ranks, but the overall ratio be good. However, a single piece may score 1/3 of those points, two pieces 2/3, and three pieces the full points.
This might help the tactical prowess of heavy pieces.

Defending objects with pieces on least advanced ranks
Defending objects with pieces on least advanced ranks (the 1st and 2nd for white) will score some additional bonus points, as the defenders there are more difficult to attack.
+30mps for a defender placed on the last rank
+15mps for a defender placed on the second last rank

Attacking objects in different ways
Attacking objects in different ways (along a diagonal, along a file, along a rank and with a knight) should score some additional bonus points, as usually this will be useful from a

tactical point of view. The supposition will be that attacking a pawn, for example, with a queen along a diagonal and a rook on a file will be preferable to attacking the same pawn with a queen on a file and a rook on the same file.
1/10 higher value for a second way of attacking the same object
another 1/10 over that for attacking the same object in a third way
and still another 1/10 over that (3/10 above standard value) for attacking the object in a fourth way

Attacking squares of the enemy king shelter in different ways
Attacking squares of the enemy king shelter in different ways (with pieces on files, ranks, diagonals or with a knight) will score some additional bonus points, as this will be conducive to tactical solutions.
1/5 higher value for attacking the same square of the shelter in a second way (the first will be the way most pieces attack this square, etc.)
still 1/5 above that (2/5 overall) for attacking the same square in a third way
and another 1/5 for possibly attacking the square in a fourth way

In the case that pieces attack different squares of the enemy shelter in different ways, they might score 1/15 higher values for each subsequent way of attacking the shelter after the first.

Compensation
Compensation will refer to the ability to assess a position in one's favour when down in material and not able to compute a forced advantage based on a variety of subtle positional factors. Engines definitely have problems with compensation. The following rules might be useful for a game along the lines of compensation:

- 2 more backward pawns (only fully backward ps will be considered, and not semi-backward and backward-fated ones) the enemy has than you will give you +25cps additionally; a third surplus backward pawn with the enemy might add another 10cps to your advantage, etc.
- each blocking knight when part of bigger fixed structures that can not be attacked by enemy pieces of equal power will score +25cps additionally to other bonus points
- 3 more own pawns and pieces into the enemy camp than the enemy's pawns and pieces into your camp will give you 25cps additionally
- 2 more unopposed ps than the enemy has will score 15cps additionally to other bonus points for the ps.

Lead pawns in terms of closeness to the enemy king
One square in between the lead p and the enemy king (with the p going along the way of a king) will give you +15cps
2 squares in between the p and the king will score 10cps
3 squares will be worth 5cps

When doing lead ps, lead ps part of the own king shelter might not be considered, as this could only complicate things. Groups consisting of only 2 ps with both still into the own camp might score 1/2 the usual values.

Piece configurations in terms of complementarity

Piece configurations are meanigful because of the extent of control of complementary squares.
If we introduce the concept of piece capacities, this might be of help.
Pieces will have 4 capacities: diagonal pieces, linear pieces, knights for controlling squares not accessible to other pieces and 2 bishops for controlling squares of different colour.
Each capacity will score 15cps. A repetition of capacity will be penalised by 5cps. Queen and bishop might get half the points of a full capacity for controlling squares of different colour.
We have 7 pieces in all with 4 possible capacities.
The queen shares linear and diagonal capacities.
In this way 2 rooks will be penalised by 5 cps for a single repetition, while 2 rooks and a queen will get -10 for 2 repetitions.
QBB - we will have 3 capacities - linear, diagonal and 2bishops, with 3 repetitions, but the half-way capacity of queen and bishop might not be considered here, because the 2 bishops have sufficient control of complementary squares.
In the simplest case of QB vs QN, we will have 3 capacities for the QN with no repetitions, and 2.5 capacities for QB - linear and diagonal in the queen and half capacity for queen and bishop, 1 repetition. This will make QN better by some 12cps. That is roughly what I thought initially about it, judging by an eye-measure.
Please, note, that this rule could be applied only for assigning points in terms of control of complementary squares for different piece configurations and might be useful in distinguishing between finer elements of the configurations' overall power and influence on the board. It could be indicative of how a certain piece configuration fares in relation to other piece configurations in a very wide variety of cases, but not all. Different relevant factors should also be considered, like bonus for heavy pieces on an open file or the 7th rank, bonus for the knights with bigger fixed pawn structures, etc.

Using the above system, different configurations might get the following points:

Q - 30cps
QN - 45cps
QB - 32cps
QR - 25cps
RB - 30cps
RN - 30cps
RR - 10cps
NN - 10cps

BB - 25cps
BN - 30cps (it might look strange that BN gets higher value than BB, but this is true just in terms of complementarity and for the game in general; indeed, 2 bishops, when not in an open position, in many situations might not be an asset, a badly needed knight might just come in short)
QRR - 30cps
QRB - 27cps
QRN - 40cps
QBB - 27cps
QBN - 47cps
QNN - 40cps

RBN - 45cps
RNN - 25cps
RBB - 32cps
RRN - 25cps
RRB - 25cps

BBN - 32cps
BNN - 25cps

QRRB - 27cps
QRRN - 35cps
QRBN - 42cps
QRBB - 30cps
QRNN - 35cps
QBBN - 50cps
QBNN - 47cps

RBBN - 55cps
RBNN - 40cps
RRBN - 40cps
RRBB - 35cps
RRNN - 20cps

QRBBN - 40cps
QRRBN - 37cps
QRRBB - 25cps
QRRNN - 30cps
QRBNN - 37cps

RBBNN - 50cps
RRBBN - 50cps
RRBNN - 35cps

QRBBNN - 35cps
QRRBBN - 35cps
QRRBNN - 32cps
QRRBBNN - 30cps

When we have the bonus points in terms of complementarity for the different piece configurations, we might measure the difference in performance in terms of complementarity and use it as an additional important factor to score positions.

Lead pawn of a group with root pawn connecting to a neighbourly diagonal connection, part of larger fixed structures, in terms of closeness to the enemy king
In this case (eg. wps c3,d4,e5,f6, b4,a5, with fixed black counterparts) the lead pawn on a6 is due bigger bonus points for closeness to the enemy king, 1/3 higher points for each own pawn of the neighbourly connection but the root p, because the larger closed structures will make seeking out counterplay more difficult.

Same piece defending more than one objects
If one and the same piece defends more than one pawns and pieces, the second defended object should get 1/5 lower value, the third still another 1/5 lower, etc., because this way of defending is prone to some tactical shots. But defended pawns and pieces might be considered separately.
The same rule could apply to pawns defending own objects.

A possible way of doing x-ray attacks (to avoid extreme complications) could be to do just diagonal pieces (queens and bishops) attacking rooks and knights, and linear pieces (queens and rooks) attacking bishops and knights. Pawns might fit into both.

Weak spots in terms of the existence of an own p behind the weak spot
Eg. weak spot on f6, bpf7 In this case the weak spot should be penalised higher because of space considerations. 1/5 higher penalty is indicated.

Backward-fated ps that do not cancel each other
Usually backward-fated ps cancel each other, except in terms of ranks (eg. wpsb5,c4,d5, bpsb6,c7,d6). But when this is not the case, such ps are major weaknesses.
Backward-fated p when unopposed
Eg. wpsb5,d5, bps b6,c7,d6 A backward-fated p when unopposed is a major weakness. This is really the case not to be an unopposed pawn. Such a p fully deserves its big penalty as it can be attacked on the file where it is placed by the enemy heavy pieces.

Backward-fated p when being the less advanced double p
Eg. wps d3,c4,d5, bps c5,d6,e5 White has double ps part of a group and some space advantage. But the real difference is the backward-fated p on d3. A white p on e4 instead of d5 would be the much better choice, as now the backward-fated p is easily attacked. Besides, a p on e4 would leave black with the same backward-fated weakness. Therefore, the big penalty for the d3 p is fully deserved.

Mutually backward pawns
Eg. wpa4, bpb6 This is the archetype of a backward p, but it occurs extremely rarely in practice, because such ps are easy targets. Therefore, the standard backward p is of the type wpa4, bpsa5,b6. While the bpa5 stops wpa4, making it not backward, the same is true of wpa4 in respect of bpa5. But bpb6 remains backward.
Mutually backward ps could be done in terms of ranks. Because such ps are very volatile, their penalty should not be big, maybe 1/2 that of a fully backward p, or around 12cps.

Weighting of tactical factors in relation to specific game elements
Tactical factors (attacks, x-ray attacks, pins, open files, etc.) will be weighted in relation to specific conditions on the board.
Tactical factors will be weighted down in relation to the growing number of pairs of fixed ps.
Tactical factors will be weighted up in relation to the decreasing number of ps on the board.
They will be weighted down in relation to the decreasing numbers of pieces on the board (going by 2 pieces, for example). It makes more sense to weight in relation to the number of pieces and not material strength, because tactics is more closely linked to the interplay of different pieces than to the power of a piece.

Drawing chances with different pieces on the board
Some pieces are more exposed to drawing outcomes than others.
Queens on the board - 10% higher drawing chances (positive score might be reduced by 1/10)
Rooks on the board - 15% higher drawing chances (for a single rook or for 2 rooks)
Knights on the board - 10% lower drawing chances (positive score might be increased by 1/10; this will concern one or 2 knights on the board)
Same-colour bishops - 10% lower drawing chances
Opposite-colour bishops - 20% higher drawing chances
2 bishops each side on the board - 15% higher drawing chances

Differentiating between a potential passer and an unopposed pawn
For practical reasons, a potential passer could be considered if the side with the surplus pawn is able to create a passer within 4 own moves (3 consecutive null-moves might be applied). Otherwise, the surplus p could be considered just as an unopposed p.

Unopposed ps in terms of enemy ps stopping their advance
The standard unopposed p will be the case when 2 enemy ps stop its movement forward on adjacent files.
If just one enemy p does that, +5cps might be added to the unopposed pawn's bonus.
When there are 3 enemy ps stopping its advance, -2cps might be subtracted, and another -2 in the case of a fourth enemy pawn.

Pawn on the 4th rank horizontally adjacent to an enemy p that has gained space advantage on the 5th rank
Eg. wpd5, bpe5 Such a pawn (e5 in this case) will deserve some bonus points, as it can not be made backward by the adjacent p, besides, it controls some important squares (+7cps).
In the case that such a p pertains to a file of the king shelter, the bonus might increase to 11 cps.

Fischer perfection
Bishop on a square where it can not be attacked by enemy minor pieces within 2 moves. (+10cps)

Rook behind own p able to attack enemy ps pertaining to a diagonal connection
+2cps. In this way files could be opened.

3 own pawns horizontally adjacent on the 4th rank
These ps are about to gain space advantage in different ways, and they could also support each other in different ways. +6cps

Pieces defending more than one square of the own king shelter
If a piece defends more than one square of the own king shelter, values for squares after the first should be somewhat decreased, by 1/7 for each subsequent square, as such way of defending is prone to tactical refutations.

Fixing an enemy pawn attacking the king shelter with an own p before it enters your own camp
Fixing such a p (eg. wpg4, bpg5), with larger fixed structures on the board, and another enemy p already into your own camp (bpf4, for example), should be a reasonable solution

(+15cps for wpg4), as otherwise 2 attacking enemy ps already into your camp would be a very dangerous alternative. This might be a possible defensive technique against attacks with larger fixed structures. Having less own ps in the shelter might not be that bad, if fixing is successful.

Additional bonus points for lead ps in terms of closeness to the enemy king when the root p of the structure with the lead p is a common root p of another diagonal connection

In this case the lead p of the larger group, closest to the enemy king, should receive +3cps in terms of closeness to the enemy king for each p of the neighbourly connection but the root one, as larger diagonally connected structures, even with lead ps in different directions of the board, would definitely benefit development of own pieces while thwarting development of enemy pieces. In this way attacking chances would certainly increase, and that could be measured best by the bonus points assigned to the lead p.

Considering semi-fixed pawns with bigger fixed structures and for other purposes

When taking stock of the number of fixed pawns, semi-fixed pawns (eg. wpsc4,d3,e4, bpsc5,d6,e5 - d3 and d6 would be such ps) could be counted as fixed.

2 pawns stopping the more advanced double p

When 2 ps stop the forward movement of the more advanced enemy double p (eg. wpse3,g3, bpsf7,f5), an additional penalty for the double p is indicated (-5cps), as undoubling is problematic.

Lasting space advantage in terms of minor pieces

When own minors into the enemy camp are defended by other minor pieces, they are due some additional points.
+3cps for a minor on the 5th rank defended by another minor pieces; double that if the defending pieces are 2
+5cps for a minor on the 6th rank defended by another minor piece; double that if the defending pieces are 2

Rook frontally attacking enemy ps on the 6th and 7th ranks

A rook frontally attacking enemy ps on the 6th and 7th ranks is due some additional bonus, as on capturing such ps the rook would land directly on an advantageous position.
+2cps for attacking ps on the 6th rank
+4cps for attacking ps on the 7th rank

Same pawn making one enemy p backward and another one backward-fated

1/4 lower penalties for the backward ps

Placement of pieces behind the lead pawn

Own pieces placed immediately behind a lead p (eg. wpsf4,e5, wne4) are due some bonus, as usually it is more difficult to attack them there.
+7cps for a knight behind a lead p
+5cps for a bishop
+3cps for a rook
and +1cp for a queen

Unopposed pawns in terms of own ps helping their advance
Unopposed ps will receive some bonus for the number of own ps supporting their forward movement (i.e., controlling squares along the forward movement of the p).
+2cps for each own p controlling such squares
+3cps if the squares controlled are by double ps on the same file (as usually the p will be able to advance more forcefully in this way)

Pieces attacking the lead pawn
Pieces attacking an enemy lead p are due some additional bonus, as this way of attacking usually prevents the p defending the lead pawn from advancing. 1/5 higher value might be indicated.

Apparent root pawn
An apparent root p would be one, that is actually not a root one, but the real root p behind it has an own piece placed immediately in front of it vertically, so that the square in front of the apparent root p remains undefended pawn-wise. Eg. wpsf2,e3,d4, wnf3 - e3 would be such a p.
+5cps for the enemy side for 2 enemy ps controlling the square in front of such a p (e4 in this case); some enemy pieces might land there forcefully

Tactically relevant pawn
A tactically relevant p would be one that is able to advance at least 1 square forward and which, if it were to advance, would attack a number of enemy objects (pawns or pieces).
+5cps if such a p is able to attack just one enemy object upon advancing
+15cps if it is able to attack 2 enemy objects upon advancing

Prioritizing evaluation factors
If we had to prioritize evaluation factors, the following might be true:
1. position of the king (the square where it is placed)
2. king shelter (first and foremost pawn shelter, but also minor piece shelter)
3. king attacks (control of open files included)
4. attacking enemy objects
5. control of center
6. different types of weak ps, etc.

In chess, everything revolves around the king, so it is natural that the square where it is placed is the most important factor with direct bearing on other evaluation parameters. The way the king is protected and the way of attacking the enemy king would come in second and third. Only after that comes attacking enemy objects and control of center might slide to 5th rank. Considering weak ps seems to be even less important. But, of course, with relative equality for the first couple of parameters, weak ps might actually have a decisive say.

In the endgame, the picture might look as follows:
1. attacking enemy objects
2. considering passers
3. considering weak ps

Substantial piece values
Substantial piece values would be the piece values assigned to a particular stage of the game plus all additional bonus points or penalties dispensed in relation to specific functions pieces

perform on the board, either by themselves or collectively. The real piece values are always the substantial piece values and not the ones that are basic for the stage of the game, but just and abstraction.

A good evaluation should consider as wide an array of functions as possible.
In the case of the knight, the least important piece, for example, we might have to consider some of the following elements:
- mobility
- general piece positioning
- space advantage gained (a knight on the 5th rank, for example)
- enemy objects attacked
- squares of the enemy king shelter attacked
- squares the knight controls (for example, in front of enemy weak ps)
- defending own pieces
- defending squares of the own king shelter
- possible intersections with other own pieces
- possible tandems, for example, with the queen
- control of complementary squares collectively with other pieces (capacities for different piece configurations might be considered)
- control of enemy weak spots
- control of continuous squares, for example, in tandem with a pawn
- blocking enemy passers (separate)
- blocking when part of bigger fixed structures
- possibility for enemy ps to attack the knight (outposts)
- number of own ps defending the knight, etc., etc.

These elements might multiply in considering a wide variety of possible other, more or less subtle, functions.
In this way, in order for an evaluation of a single, even the least important, piece to be accurate, you need to consider at least some 20 different elements. I am absolutely convinced that an engine that evaluates more will do better in 80% of cases, although in 20% of cases an engine that evaluates less might still do better. Of course, tuning the parameters will be important. It is better to have 5 parameters that are well tunes than 15 that are badly tuned. The 5 well tuned parameters might do well in a variety of situations, including such supposed to be covered by parameters that are not covered, while the 15 badly tuned parameters might be unable to produce good decisions even for the situations supposed to be covered by the most important terms.

Tuning the parameters
A good approach before starting to fine-tune the parameters (which is undoubtedly very important because of the tremendous amount of specific situations they will refer to) might be to try to mentally tune them to save yourself a lot of testing. Evaluation parameters are very logical in themselves, referring to some objective truth, and therefore a mental cross-check might be meaningful. It is important that all parameters correlate adequately. If you have 5 parameters, a sensible try would be to see the correlation of all of them in a single pool. Cross-checking parameter 1 to parameter 2, to parameter 3, to 4 and 5, then cross-checking parameter 2 to 3, 4 and 5, etc., might be well indicated. In this way it is possible to observe a broken link, some values that are too low or too high. When you have a pool of more or less meaningfully correlated parameters, fine-tuning might proceed.

Substantial pawn values
Substantial pawn values would be the values assigned to pawns for different stages of the game plus additional bonus points or penalties in terms of the different functions pawns accomplish on the board. Substantial pawn values are the real values of pawns and not the values assigned to pawns for game stages.

A good evaluation of a pawn would take into consideration:
- controlling central squares
- defending pawns that control central squares
- space advantage
- defending ps gaining space advantage
- file and rank the pawn is on
- being or not a passer, potential passer or unopposed p
- being or not a backward pawn, possibly even part of the king shelter
- its status as a double and isolated p; and is it isolated horizontally or vertically
- pertaining or not to a group of ps
- status as a lead or root p; lead p on a weak spot, possibly part of the enemy king shelter
- controlling weak spots
- being or not part of the king shelter; specific square of the shelter
- intersections with own pieces
- fixing enemy pawns
- possibility to attack the enemy king position, etc., etc.

These are just a small portion of the elements that could be applied to a pawn. In general, the more detailed the evaluation, the more accurate the understanding of the position will be, as smaller, but important elements do not fit into the picture of an inconsiderable number of parameters, although extremely well tuned.

Scoring weak pawns with a pair of bishops each side
When both sides have a pair of bishops, weak pawns (double and isolated) may be scored 1/2 the usual value, but not with non-existent penalties. Although bishop pairs tend to increase drawing chances, it is not easy to foresee for how long the pairs will remain on the board; at the same time it is not clear how long the weaknesses will endure, and therefore choosing a half-way solution might be indicated.

Directions of diagonal connections
A direction of a diagonal connection will be the way the connection goes. Going towards the king side or going towards the queen side are 2 possibilities. If the lead p is closer to the h file than the root p, then the direction is towards the king side. If the lead p is closer to the a file than the root p, then the direction is towards the queen side.

Bonus for 2 diagonal connections going into the same direction
When 2 diagonal connections go into the same direction, they are due some bonus points, as the lead pawns of both groups are well-coordinated. +10cps might be a good measure. But groups consisting of just 2 ps on the 2nd and 3rd ranks might be excluded from this.

A diagonal connection with a direction towards the side where the enemy king has castled

+5cps additionally for such an arrangement might be justified, as this is an optimal way of building such structures. Again, groups of ps just on the 2nd and 3rd ranks might be excluded from this.

Drawing chances with opposite colour bishops in terms of different configurations
Opposite colour bishops tend to increase the drawing chances for the weaker side. When opposite colour bishops are the only pieces on the board, the weaker side might get +50cps in compensation. With 2 pieces on the board each side, weaker side might receive +30cps. With 3 pieces each side, the compensation might fall to 20cps, and with 4 pieces each side - to just 10cps.

Scoring mobility for opposite colour bishops when part of different configurations
Mobility for opposite colour bishops, when they are part of piece configurations, is an important feature, as it may have impact not just on both pieces, but on the performance of the configurations as a whole. Therefore it could be wise to score mobility for such bishops double.

Drawing chances with single larger group of diagonally connected pawns
When being the weaker side, your drawing chances will increase, if you manage to build a larger structure of diagonally connected pawns, be it along different diagonals, and even when not fixed. This is so because such structures tend to stave off attackers and it will be difficult for the armies to come into direct clash. +5cps for each diagonally connected p might be well deserved.

2 pawns on the 5th rank making 2 enemy ps semi-backward on the same side
Eg. wpsa5,d5, bpsa6,b7,c7,d6 1/5 higher penalty for the semi-backward ps is due, as the semi-backward ps support each other's movement forward and that might have some implications for their status.

2 horizontally adjacent pawns on the 4th rank with one of them connecting diagonally to a less advanced p
+7cps for such ps, as soon a more extended diagonal connection might appear

2 horizontally adjacent lead pawns on the 5th rank
Eg. wpse4,f5,h4,g5 +8cps for such an arrangement, as the possibility for building a more extended diagonal connection with the lead p gaining substantial space advantage, is real.

Apex pawns
An apex pawn will be the designation for a lead p defended by 2 pawns, i.e. a lead p of 2 diagonal connections at the same time. Apex pawns are due some bonus points, as they are a very stable feature of the position, and lead pawns are valuable.
+3cps for an apex p; double that, if fixed
Apex ps on the 3rd rank will not be considered.

Apex pawns in terms of ranks
Apex ps are possible from the 4th to the 6th ranks.
An apex p on the 4th rank might get the standard value, a p on the 5th rank 2cps more, and a p on the 6th rank still another +2cps.

Apex ps in terms of files
It would not make sense to consider apex ps in terms of files, as lead ps will sufficiently cover this.
Apex ps on the a and h files are impossible to occur.

Pieces attacking apex ps
Enemy pieces attacking apex ps is counterproductive and a waste of time.
-2cps for such pieces

Own knight behind an apex p
Own knight placed on the square immediately behind an apex p, if possible, would be an asset. The knight enjoys a quiet stay there.
+4cps for such a knight

Pieces defending an apex p
Pieces defending an apex p, even on an x-ray diagonally, deserve a bonus.
+1cp for such pieces, as this could make possible the further advance of a p defending the apex p.

A backward p whose only support for advancing forward is another backward p
A backward p whose only support for advancing forward is another backward p should be counted as a standard backward p. Eg. wpsg3,h4, bpsh5,g6,f5 - f5 is such a p.

A deficient majority pawn
Eg. wpsg3,h4, bpsh5,g6,f5 The black pawns on g6 and f5 are backward, while the white pawn on g3 is backward-fated. Black has also an unopposed p on f5, which is supposed to be an advantage. Overall, the majority pawn is not felt, because in this particular situation it is far easier for the white pieces to attack the enemy ps than the other way.

2 apex ps on the same rank one square away
Eg. bpse6,d5,c6,b5,a6 - d5 and b5 are such ps Some bonus (+4cps) is indicated for such an arrangement, as a wide number of ps (e6,c6,a6) are able to advance while retaining the cohesion of the structure.

Medium pawns
Medium pawns are the pawns in between the root and the lead p along the diagonal connection. Medium pawns are relevant in terms of supporting the cohesion of the diagonal structure.
As the biggest diagonal connection would consist of 5 ps, from rank 2 through rank 6 (7th rank would be excluded, as this would be the case of a connected passer), the number of medium ps in a single structure is 3 at the most. They could be subdivided in three categories:
- medium ps in the first degree - immediately behind the lead p
- medium ps in the second degree - one square away from the lead p
- medium ps in the third degree - 2 squares away from the lead p

In terms of importance for the cohesion of the structure medium ps in the first degree are most valuable, since in the case of enemy ps attacking them, the structure as a whole would suffer most appreciably; and medium ps in the third degree are least valuable, since enemy ps

attacking them would make the structure suffer least appreciably. The following bonus points might be dispensed:
ps in the first degree - 15mps
ps in the second degree - 10mps
ps in the third degree - 5mps

Medium ps will receive no bonus when all ps of the diagonal connection are fixed, as in this case enemy ps attacking them would be irrelevant.

Definition of a backward pawn
A backward pawn is one that is not able to advance without being captured by an enemy p for nothing, and that could not be supported by another, less advanced own pawn, in its advance, either because there is not such a p, or, if there is such, it would be either fixed, or also backward.

Attacking static objects
Attacking static objects (objects that could not move), usually pawns, but in some cases also pieces, is due some additional bonus (1/10 higher value), because such objects are easier targets. Eg. wpsb3,a4, bpa5 - a4 and a5 would be such ps, but also b3. Of course, ps that are defended by other own ps might be skipped when applying this rule.

Playing in a tactical and in a positional key
Most positions would not be identical what concerns tactical and positional patterns. Usually positions with available positional solutions would prevail, maybe some 80 to 20%, but of course, those 20% of cases where a tactical solution is required are very important, because they will have an impact on the game as a whole. Positional solutions would usually prevail, simply because most of possible moves are associated with positional elements, like good mobility, optimal positioning for all pieces, control of center, space advantage, weak pawns, etc. In this way it makes sense to have a standard evaluation function for most positions featuring positional elements, and a modified one for the relatively lower number of positions featuring tactical elements.
A tactical position could be recognized by a number of salient factors: a large number of open and semi-open files for both sides, a large number of pins for both sides, a large number of attacks for both sides, a large number of attacks on enemy pieces along an x-ray (but only attacks of pieces on enemy pieces of different capacities - linear pieces attacking bishops and knights, and diagonal pieces attacking rooks and knights - would be considered), a large number of squares controlled by pieces along the ray of action of an enemy piece defending another enemy piece (deflection possibilities), unsafe kings (square where the king is placed and number of pawns on adjacent squares).
When such factors are present in abundant numbers, it would make sense to increase the values for those factors a bit, by 1/3, so that the engine will first consider variations with a tactical underpinning.
The following system of points for determining the tactical nature of a position might apply (please note, that those points will be relevant just in this respect and will have nothing in common with assigning bonus points in ps, cps, etc.):
each open file for one of the sides will get 10pts
each semi-open file for one of the sides will get 5pts
each pin for one of the sides will get 7pts
each attack on a piece for one of the sides will get 3pts

each attack on a pawn for one of the sides will get 1pt
each attack along an x-ray on an enemy piece for one of the sides will get 5pts
each square controlled along the ray of action of an enemy piece defending another enemy piece, for one of the sides, will get 2pts
enemy king not on g1/g8 square will get 15pts
less than 2 pawns on squares adjacent to the enemy king will get 10pts
battery of queen and bishop (queen in front of bishop) attacking the enemy king position, for one of the sides, will get 10pts
rook on the 7th file, for one of the sides, will get 10pts
queen and rook on an open file against the enemy king position, for one of the sides, will get 15pts

If the total number of points for the position exceeds 55, then it would be reasonable to evaluate the position in a tactical key, i.e. increasing by 1/3 the relevant tactical factors. That would certainly help to achieve a more balanced play overall.

Deflection

Deflection is a tactical shot, by force of which an existing connection between two enemy pieces (one defending the other or both defending each other) is severed, or the severing concerns an existing connection between an enemy piece and a specific square (an enemy piece defending a square of the king shelter). Usually this will involve a sacrifice of a temporary nature leading to advantageous gains in the long term.
There are 2 ways to deflect enemy pieces: either by luring them away by way of sacrificing to a square where they would defend no more the own piece or specific square, or by executing a sacrifice on a square along the ray of action of the enemy piece defending another enemy piece or a specific square of the king shelter, by way of which the communication between the enemy objects is severed (an enemy piece or pawn capturing on the square where the piece is sacrificed).
Indications for possible deflection moves would be piece and pawn control of squares along the ray of action of an enemy piece defending another piece or specific square, especially when there are intersections; and piece control of squares simultaneously controlled by the said enemy piece.
Bonus points could be dispensed as follows:
+5cps for intersections of own pawns and pieces or own pieces along the ray of action of the defending enemy piece
+3cps for piece control of each square simultaneously controlled by the defending enemy piece that is not along its ray of action to the defended piece or specific square
Of course, much bigger bonus points might be dispensed, but it is not very often that deflection possibilities will exist.

Counter-indicated closure of sides

Completely closing one of the sides (all 4 ps fixed or semi-fixed), even gaining space advantage, when the enemy has space advantage on the other side and it is still not completely closed, is counter-indicated and wrong, since the enemy could only increase his advantage on the side where he is better, even to a winning point, while you will be unable to seek out counterplay on the other side.
-50cps for such a development is a decent penalty

Attacking the endmost enemy pawn part of a larger fixed structure
Attacking the endmost enemy pawn (in terms of files; i.e. ps at both ends of the structure) part of a bigger fixed structure, with an own pawn, is a good positional move, since this will either help opening files, or force the enemy search for possible ways of defending the attacked p, the alternative being collapse of the structure.
+5cps for such a move

Recaptures
When 2 pieces attack each other, a wider range of own pieces defending the attacked piece would only be to appreciate in the event of the enemy piece taking the own one.
+8mps for any defending piece

Pieces defending an own p with 2 ps attacking each other
When 2 ps attack each other, the number of pieces defending the own p would matter in the event the enemy p executes a capture, as this would suggest a wider range of recapturing possibilities.
+8mps for any such piece

Defending a lead p in terms of files placements of the defending pawn
A pawn defending an own lead p would receive some bonus in case it is a less central pawn than the lead, as in the event that the lead p is captured, it will reproduce itself with positive implications for the overall pawn structure in terms of centralisation.
+15mps in such a case (eg. bps c6,d5 would be preferable to bps e6,d5 and receive a bonus)

Defending a pawn that is attacking an enemy p with the enemy p being fixed
Eg. wp d4, bpsd5,c5,b6 This particular situation will favour the own attacking pawn (c5), as the enemy side will have to find a way of protecting the attacked own p, while capturing looks problematic.

A structure consisting of a single group of pawns representing a number of diagonal connections
In the case a number of diagonal connections make up a single whole (with one of the ps of the connection horizontally adjacent to a pawn, member of another connection), some bonus points would be indicated (+10cps), as such a structure is both flexible and solid, at least to a certain degree. But the points would be dispensed only if the single whole consists of at least 6 pawns.

Doing semi-backward pawns
Semi-backward pawns are not straightforward to do, because with such ps everything will depend on the relatively better piece control of the square in front of the semi-backward pawn. But since usually the side making the enemy pawn semi-backward exercises better control over that square, assigning a decent penalty is not entirely devoid of reason.

A backward pawn with the backward-maker fixing another enemy p and both ps being endmost in terms of files
Eg. wpe5, bpse6,d7, no pawns on the f file In that case, when the backward-maker fixes another enemy p with both being endmost in terms of files (i.e. closing a group of pawns horizontally), the backward pawn is due some higher penalty (by 1/3), as an attempted advance of the backward p will result in a horizontally isolated p.

Number of pawns able to support an own pawn's advance
+15mps for any such p (possible moves will be considered)

Attacking a piece of same power, defended by a pawn placed on less central file
Attacking a piece of same power that is defended by a p placed on a less central file than the piece itself is due some penalty (-10mps), as in the event of a capture on the square defended by the pawn the enemy pawn structure will improve in terms of centralisation.

Quick-footed queen
+5cps for having access to both sides
+15cps for having access to the side where the enemy king has castled
+3cps for controlling a square along an x-ray on the side where the enemy king has castled

Additional factors to consider playing in a tactical key
- number of enemy objects attacked twice or more times (double, treble attacks, etc.)
- intersections of pieces on squares of the enemy king shelter
- number of ps having gained space advantage that are not fixed (passers included)
- bigger number of pieces than pawns left on the board (3 more pieces could signal conditions of extreme tactics; in this case relevant tactical factors could have their values increased by more than 1/3)

Space advantage in terms of pawns on squares of different colour
Gaining space advantage with pawns on squares of different colour should get some bonus points, as this way of gaining advantage is in line with control of complementary squares in an important area of the board.
+10cps if pawns gaining advantage are on black and white squares

Bonus for pieces defended by pawns
When pieces are defended by pawns, they would be due some additional bonus points, as such way of defending is useful from a tactical points of view. Pieces defended by ps can safely stay where they are in case of an attack by an enemy piece of equal power, while sometimes this would be problematic if the piece is defended by just another own piece.
+2cps for any such piece with one pawn defending it
+3cps for a piece with 2 ps defending it

Bonus for 2 knights with bigger single group of diagonally connected ps
With a bigger single group of diagonally connected ps 2 knights would be due some bonus, as the knights would not have big difficulties to find appropriate outposts and, generally, more compact structures favour knights.
+5cps with a structure of 5 ps
+7cps with 6 ps on the board
+9cps with 7 ps
and +11cps with 8 ps

Penalty for king being too far away from an enemy passer
A king being too far away from an enemy passer is due some penalty points, as this might have some repercussions on the course of the game. The distance in squares from where the king is to the promotion square of the enemy passer will be measured.
6 squares to go in between - -20cps
5 squares to go - -15cps

4 squares - -10cps
and just 3 squares away - -5cps

Piece mobility restricted by enemy ps having gained space advantage
Pieces whose mobility is restricted by enemy ps that have gained space advantage are due some penalty points, as such a way of restricting mobility will have a more lasting impact.
-5cps for any square where a piece could be mobile controlled by such an enemy p
-7cps in the case that the ps are fixed

Superiority of pawns on the side where the enemy king has castled
A superiority in pawn numbers on the side where the enemy king has castled (with equal number of ps the enemy will have pawn majority on the other side) will have to receive some bonus points, as it is likely that will have some repercussions on attacking the enemy king.
+10cps for such an arrangement

Attacking squares from where the enemy king could be checked
Pieces attacking squares from where the enemy king could be checked are due some higher value (1/15 higher), as that could have repercussions in case of tactical complications.
If such pieces attack similar squares of the enemy king shelter, the increase in value could be by 1/8.

Doubling of rooks on ranks
Doubling of rooks on ranks (except the 1st and the 7th rank, which are normally scored) is due some well-deserved bonus (+15cps), as in this way rooks will be able to attack in a more synchronized way.

Distance of bishop to an own pawn
Usually it is not good for bishops to be on diagonals where there are own ps. Therefore, the distance in squares in between the bishop and the pawn could be of importance. Penalties could run as follows:
no squares in between - 25mps
1 square in between - 20mps
2 squares - 15mps
3 squares - 10mps
4 squares - 5mps
and 5 squares - just 3mps

Rook having mobility just on a file or on a rank
When a rook has mobility just on a file or on a rank, it is due some penalty, as this definitely influences its overall performance.
-7cps for such a rook

Knight on the 5th rank that could be attacked by just one enemy p with enemy piece in front of it
In that case, when an enemy piece prevents temporarily the possibility of pawn attack on the knight (eg. wne5, bpf7, bnf6), the knight is due a small additional bonus to other points (+3cps), as such an arrangement suits the knight, although this might not be the perfect outpost.

Trading a central pawn on the 4th rank for a similar enemy's
Trading a central e or d pawn on the 4th rank for a similar enemy's makes sense only if equality in the number of central ps with such a status is observed. It would be wrong to trade a central p for an enemy's when the enemy would still have a central p on the 4th rank, but you would not. This would be a major mistake, as you would not have sufficient control of squares into the enemy camp, while the enemy would have such. It would be preferable that the enemy gains space advantage with a number of fixed ps, as this would make converting the advantage more difficult.
-15cps for such a move
Eg. wpsd4,e4, bpsd5,e6 Capturing on e4 would be bad, as white would still have d4; allowing white to play e5 might be the better alternative.

Transferring the king to a safer haven
When the king side is attacked by enemy pawns, and there is no option to defend effectively, a wise decision would be for the king to leave its attacked shelter and try to find a safer place, either in the center, or on the other side.
+50cps for such a move

Piece control in front of storming pawns
Pieces controlling the square in front of pawns storming the enemy king shelter are due a bonus (+5cps), as this could have vital repercussions on whether the attack will be successful or not. Both own and enemy pieces will be considered. Rooks and queen behind the attacking p will also count.

Pawns attacking the enemy p immediately in front of the root p in a diagonal connection
Pawns attacking the enemy p immediately in front of the root p in a diagonal connection are due a decent bonus (+4cps), as this will either open files, or move the root p one rank ahead, which is always a success for the attacking side.
+7mps for pieces (both own and enemy), controlling the square diagonally in front of such a p (eg. if the p is on c3, such a square would be b4), as on this would depend if the attack is successful or not. Control of the square along an x-ray will also be considered.

Rook on the 6th rank
The rook on the 6th rank will be due some bonus (+6cps), as there it could possibly attack root pawns, but also squares of the enemy king shelter.

2 pieces on the same rank one square away with an enemy p in front of them on the file in between
Eg. white pieces on f3 and d3, black p on e7 This situation is not favourable for the white pieces, as a possible advance of the enemy p could suddenly threaten both pieces.
-3cps for such an arrangement

The definitive stop
With the enemy heavy pieces attacking on a file objects into the own camp or squares of the own king shelter, an optimal way of defending would be having a minor piece on the 4th, or even 3rd, rank, on the file where the heavy pieces attack, defended by 2 ps and with enemy ps unable to attack it. This could make a powerful attack ebb away. Of course, a bishop on such a position could score lower, as bishops badly need mobility. The following points might be dispensed:
+7cps for a bishop; +12cps if it stops an attack on the own king shelter

+10cps for a knight; +15cps if it stops an attack on the own king shelter

Control of squares into the enemy camp

Controlling squares into the enemy camp might be very important. Each square controlled by a piece might get +5mps additionally, but, of course, minor pieces might score relatively higher than rooks, which in turn could score higher than the queen. Pawns controlling squares into the enemy camp could get +10mps for each square. This might be an alternative way of measuring space advantage, but both ways - measuring space advantage in terms of ps into the enemy camp, and in terms of control of squares, might successfully complement each other and provide a more realistic assessment.

The primary importance of mobility

Mobility is undoubtedly the most important factor of all. Pieces attack with mobility, they defend with mobility, and with mobility they move around. It is a representation of their strength. Mobility at a certain point of time for a given piece measures its objective strength in a specific environment, which is not exactly the same as the more or less abstract value assigned to it. Pieces with lower power but higher mobility might well be more important for the overall development of events on the board. Therefore, the impact of mobility should not be underestimated at all. If a piece has an extremely low mobility, this could be an indication of upcoming problems. Having such pieces should be avoided at all costs.

A particular feature of mobility that makes it suitable for predicting future events, is that it (if measured for all pieces as a whole) only changes gradually with time. This makes it especially relevant for deeper search. Moreover that the trend in mobility values usually stays the same for a longer period of time. If mobility values start increasing, they are bound to increase even further with time, and if mobility values start decreasing, they are bound to decrease even further with time. And this will usually be decisive for the outcome of the game. Measuring mobility is most often synonymous with knowing where the game is going. Therefore, it is especially important to always mind your mobility. If you have good values for other factors, but low mobility, you will, as a rule, not have sufficient compensation for your low mobility. But if your mobility is good enough, with others factors suffering, you will have good chances of winning the game.

This makes it possible for mobility to be the single most important factor for gauging real progress. It is utterly justified to discard all variations with low mobility. Whenever your mobility starts getting worse than the enemy's, you might drop further consideration of the variation. A wise trick might be to check mobility on 2 consecutive moves, and if the trend is the same, this could let you make a decision on pretty solid grounds. If 2 consecutive moves in a variation return low mobility values, just drop the variation. And if 2 consecutive moves in a variation return good mobility values, this might warrant considering it deeper. So, a prudent advice would be to first consider mobility without any other factors, and only then proceed to evaluation of other factors, but only for the variations that have returned reasonable mobility scores. In this way a substantial amount of variations could be successfully pruned.

Control of squares into the enemy camp in terms of ranks

Controlling squares of the 7th and 8th rank could score double, as it is far more important in terms of the enemy pieces' chances to develop sufficiently.

Controlling squares into the enemy camp in terms of centralisation

Central e and d files could get 5mps additional bonus, semi-central c and f files +3mps additionally, and b and g files +1mp additionally.

A single group of pawns with one of the ps gaining space advantage on the side where the enemy king has castled
Such a scenario could get a bonus of 5cps, because of the group's flexibility in attacking the king.

What to develop first
In order to reasonably complete your development, you do not need to develop all pieces. Some pieces might be left for development at a later stage. But you should, of course, see to it that your king castles. It is necessary to develop the knight on the side where your king intends to castle (usually the king side), the bishop on the same side, of course, some central pawns, and castle. Developing the knight on the other side can reasonably wait, and the bishop on the other side only needs to have a central pawn advancing, so that it is sufficiently active even on its initial position.

Bonus for minor pieces gaining space advantage on the 5th and 6th ranks when not attacked by enemy pieces
Minor pieces gaining space advantage on the 5th and 6th ranks that are not attacked by enemy pieces are due some bonus, as this might have some implications tactically.
+3cps for such a piece
+5cps, if the piece gains space advantage on the side where the enemy king has castled

Bonus for knights in terms of outpost possibilities
Each square on the 4th and 5th ranks, that is not attacked by enemy ps, and that could not be attacked by enemy ps, could score a small bonus for each knight.
+2mps
double that, if the square is central or semi-central one (c to f files)

Additional indicators for considering a position drawish on the grounds of all ps being fixed
In some cases, when not all ps are fixed, the position could still be considered drawish. To conclude that such is the case, all remaining ps that are not fixed should be either backward-fated for one of the sides, or blocked by enemy pieces in a way that those pieces could not be expelled from their blocking position (with opposite colour bishops, for example).

Attacking pawns in terms of ranks
Attacking pawns will make a difference when the enemy ps are placed on ranks from the 5th to the 7th (with white pieces attacking). Pawns are easier to attack when they are on more advanced ranks.
1/20 higher value for attacking a pawn on the 5th rank in relation to a p on the 6th rank
1/20 higher value for attacking a pawn on the 6th rank in relation to a p on the 7th rank

Rook behind own p on a file against the enemy king position
+4cps, as this might help open files in the future

Opening and taking control of the endmost file, part of the enemy king position
Opening and taking control of the endmost file, part of the enemy king position (with short castling, this will be the h file, while with long castling, the a file), will be due some higher bonus (by 1/3 the standard value), as attacking along this file is always more forceful, because enemy pieces have bigger difficulties to defend the squares of the king shelter along that file. It is simply more remote.

Attacking squares that could be part of the king shelter
Attacking squares that could be part of the enemy king shelter (i.e., the king is still in the center and not castled, but there are reasonable chances it will do so on that side of the board) is due some bonus in forestallment of developments.
1/2 the usual value for such attacks, supposing the king has already castled
Eg. If there are definite chances the enemy king will castle short, attacking h7,h6,g6 will score points, albeit the king is still in the center. Such attacks might also have the effect of preventing the king to castle at all, or compromise in advance the shelter.

King shelter with king still in the center
When the king is still in the center (on e1/e8), the shelter zone will consist of 15 squares: squares within the rectangle c1-c3-f3-f1. With the king on f1, the shelter zone will have the same number of squares, but centered around f1. It is always more difficult to defend a wider area of squares, besides, in such cases the number of enemy pieces able to attack the shelter zone increases considerably. That is why, no matter how solid a central shelter is, it is usually not a wise idea for the king to stay in the center.

Equal pins
Equal pins will be the case when a bishop pins a knight with an enemy bishop at the other end of the pin, or a rook pins a knight or bishop with an enemy rook at the other end of the pin, or a queen pins a knight, bishop or rook with an enemy queen at the other end of the pin. Even when all pieces are defended and the risk of losing material is not big because the power of the pinning piece is the same as the power of the piece at the other end of the pin, the existence of such a pin is unfortunate because of tactical considerations.
+5 to +10cps for the pinning side depending on the power of the pinning piece

King pin with the king having no free mobile squares
The case of a king pin with the enemy king having no free mobile squares is a very serious affair, because such a pin is more forceful than other pins.
+20cps additionally if such a pin occurs

Rook on a semi-open file for the enemy side
Rook on a semi-open file for the enemy side (i.e., behind an own p) is due some bonus, as this is a try to challenge control of the file.
+2cps for such a rook

King shelter consisting of fixed pawns
King shelter consisting of fixed ps (usually this will not happen with castling on one of the sides, but in the center), when the p of the shelter on the file where the king is is fixed, and at least one other own p of the shelter on an adjacent file is also fixed, is due some decent

additional bonus, as fixed structures will make opening lines for attack on the king much more difficult, if possible at all.
+80cps for such an arrangement
Of course, the ideal situation would be that the number of fixed ps is bigger with bigger existing fixed structures.

Making the difference with lead pawns

One of the most important indicators for the performance of lead ps would be the possible closeness (3 squares away or less) of a lead pawn to the enemy king. It is important to do that both in the case a diagonal connection is not fixed, and when the ps of the connection are part of bigger fixed structures (i.e. the enemy side will have a diagonal connection with fixed ps, too, often of the same size). In the first case what will matter will be the usefulness of the diagonal connection for successful development of the own pieces, and the closeness of the lead p to the enemy king will mean that own pieces are successfully developed in a close range to the enemy king, which will have some bearing on overall attacking chances, moreover that diagonal connections are usually associated with a degree of permanence of arrangements on the board. In the second case, the permanence of arrangements will only be strengthened by the fixed structures, and that is why closeness of the lead p to the enemy king will be particularly important. Both sides will have, supposedly, larger fixed structures consisting of diagonal connections with same number of ps, possibly similar values for ranks, and even files, but the real difference will be that one of the sides will have a lead p close to the enemy king, while the other side's lead p will look somewhere to the queen side (or the side opposite to where the king has castled), and practically be inefficient in terms of king attacks.
That could be used, of course, to determine well in advance if an attack on the enemy king could be successful, even if at the current point of time pieces for the side with a lead p close to the enemy king are still far away from the enemy king. The permanence of fixed structures will help those pieces to gradually develop for attack on the king, using the power of the lead p, while the other side could only patiently wait, as its attacking chances would not be helped by the own lead p. In this way, enemy lead ps close to the own king when part of fixed structures should be avoided at all costs, especially when the number of fixed ps is bigger. It seems that this is one of the biggest difficulties for engines, that often do not consider such ps and such structures important, maybe because they weight mobility and immediate attacks higher, but in the case of bigger fixed structures both mobility, as well as attacks, have different meaning, as fixed structures for the side with the lead p close to the enemy king could help that side to gradually, but forcefully, develop its pieces on appropriate attacking positions, while relatively good mobility and attacking values for the enemy side could basically come to nothing with time as the attacking potential for the other side develops. It might be wise to consider decreasing the values for mobility and attacks with similar arrangements.
Similar weak spots in engines' play are especially well taken advantage of by humans, who recognize such structures much better than engines. Resolving this issue in engines' behaviour could practically resolve the last big outstanding problem with positional understanding of top programs. Of course, there are also other deficiencies in the positional understanding of engines, but that is by far the most important one.

Outstanding positional issues with engines

Currently top engines still exhibit a wide range of outstanding positional problems. Apart from the most important deficiency in that respect, the lack of consideration of attacks

gradually building up with bigger fixed structures and lead ps close to the enemy king, top engines still have recognizable deficiencies (accounting for decent elo points in terms of positional play) in the following areas:

- difficulties to recognize drawing chances with bigger existing structures of fixed ps on the board (some engines seem to optimistic and readily close the game, pair after pair of fixed ps); humans often take advantage of this to try drawing games
- difficulties with unopposed pawns; engines seem to disregard such ps entirely, but they are important positional tools that have to be considered separately from double pawns. Double ps account for some positional deficiencies associated with the possibility of enemy attacks, but unopposed ps are indicative of a side's ability to exert efficient positional pressure because of optimal structural makeup, and those are 2 different things. Optimal structural makeup bodes well for the future, even when it is difficult to observe immediate consequences. Therefore, it is especially important not to disregard unopposed ps.
- difficulties with some separate passers (especially end file ones); engines sometimes do not hold such ps in high esteem, thinking tactics could compensate for them, but that is not always the case
- difficulties with connected passers (a pair of connected passers, for example) when those are part of bigger fixed structures; such ps are stronger than usual connected passers, because the fixed structures make it difficult for the opposite side to organize sufficiently its majority of pieces for stopping the advance of the ps. This might justify sacrificing a piece for 2 enemy ps.
- difficulties with some types of backward ps, especially when part of the king shelter (backward ps, but also backward-fated ps and semi-backward ps, part of the king shelter); engines seem to completely disregard such ps
- difficulties with backward-fated ps when they do not cancel each other except in terms of ranks; such ps are really a major positional weakness with long-lasting consequences, but engines often are oblivious of their existence
- difficulties with control of complementary squares; it seems most engines do not have optimal code for tracking this, and sometimes understanding of complementarity might well make the big difference
- difficulties with space advantage in some situations, but this is a tricky one, as a variety of other factors should be considered at the same time
- difficulties with understanding and application of blockade; not all top engines make an efficient use of blockade, especially pieces (usually a knight) blocking enemy separate passers and blocking enemy ps to prevent them from gaining space advantage; another deficiency associated with blocking is that there is almost not an engine that would consider a blocking knight when part of an own diagonal connection and also part of larger fixed structures, but such a knight is very useful both for attacking purposes and for the integrity of the connection, it could be considered both as a pawn in terms of the integrity of the connection, and as a knight in terms of attacking the enemy king.
- difficulties with functionality of pieces; most engines do not recognize the fact that there is an added value to pieces performing a variety of duties in a number of different sectors on the board: own and enemy camp, king and queen side. But performing more duties at the same time would bode well for the piece's overall strength, because, although you can choose only a single function of the piece being salient at a certain point of time, there is still the option to choose from many possible functions, and that, of course, only underscores a piece's usefulness. Functionality of pieces is one of their most positional qualities and has a direct bearing on compensation.

- difficulties with compensation; being down in material but having certain real, although more or less intangible, assets in the form of prevailing number of steady positional features, like considerably bigger number of weak ps for the enemy side, considerably bigger number of own objects gaining space advantage, etc., is a concept with which engines are not familiar. Engines fail to consider such factors, it they are unable to calculate an advantage, but with most cases of compensation the consequences of a material sacrifice are only to recognize in the very distant future, very often deeper than the calculating abilities of modern engines. In this way the logical way of proceeding is exactly the opposite: you must assign some bonus points for a variety of positional assets associated with compensation, even if you are not able to compute everything with a fair amount of precision; in a couple of moves, if the compensatory assets are correctly specified, things will become much more clear. Compensation is very important to do, because positions based on compensation make up some 10 to 15% of all chess positions. Playing with an eye on positional compensation for material shortages could provide a big boost to an engine's elo and make the engine's play much more attractive. It is true that compensation for material shortages is a tricky affair, because it is not that easy to specify compensatory assets that will work in every situation and, besides, play along the lines of compensation is often subject to very deep calculation, so the tables could turn at some point of time. Compensation is, as a whole, an unexplored area of computer chess, and humans usually also have big difficulties with it.

Knight at an endmost square of the board
A knight at an endmost square of the board (a1,a8,h8,h1) is due some decent penalty (-20cps). This is actually the worse place for any piece on the board.

Pawns supporting an own pawn in its advance
Any pawn supporting an own p in its advance is due some bonus (+5cps for each such p), as possibility of advancing is always a good sign for a pawn.

Temporary backward-fated pawn
A temporary backward-fated p is one whose advance is stopped by 2 enemy ps, and could be supported by only one own p, but is not supported at the moment. Eg. wpsg2,f3,e4, bpse5,g5 - f3 is such a p The f4 square is a weakness in white's position and could be occupied by enemy pieces advantageously. Such a p is due some penalty, but not big, 1/3 of normal penalty points for a backward-fated p, or some 10 to 12 cps.

X-ray attacks with pieces of lower power
Pieces of lower power attacking more powerful enemy pieces along an x-ray are due some additional bonus because of tactical considerations.
+7cps additionally for bishop attacking enemy rook
+10cps for bishop attacking enemy queen
+12cps for rook attacking enemy queen

Space advantage in terms of small number of fixed ps in a single group
With small number of fixed ps in a single group space advantage is relatively more valuable, as own pieces are usually able to take more active positions.
just one pair of fixed ps - 20% higher value for space advantage might be a wise decision
2 pairs of fixed ps into a single group - 10% higher value for space advantage would be a good decision

Pieces defending an own p that has gained space advantage
+7mps for any such piece, as this might have some sense in the eventuality of the p being captured

Pieces defending an own fixed pawn that could be attacked by only one enemy p
+3mps for any such piece, as this could have implications for the pawn structure that will take shape

Pieces attacking an enemy blocker
Pieces attacking an enemy piece blocking an own separate or other passer are due some bonus points (+5cps), as this could help in forcing the blocker leave its position and open good chances for the passer to advance again.

Pawns keeping under control a square from where the own king could be checked
+8mps for any such square; it is always better that the king does not get checked at all

Pieces keeping under control a square from where the own king could be checked
+5mps, as this might have some tactical implications

Rook in front of knight on the same file
Rook in front of own knight on the same file is due some small bonus (+2cps), as this is an optimal way of coordinating the 2 pieces when occupying the same file.

Continuous pawn control of squares of the own king shelter
Pawns controlling all squares of the own king shelter on the 3rd and 4th ranks are due some decent bonus, because this is a good way of defending the king position.
+15cps for controlling all squares on the 3rd rank
+8cps for controlling all squares on the 4th rank

Fragmented storming pawns
Some penalty is indicated (-3cps) in the case that the most advanced pawn storming the enemy king position is not on an adjacent rank to the next most advanced storming pawn (i.e., there is at least one rank in between, eg. bpg4, bph6), as attacking in a fragmented fashion the enemy bastions is not the solution to prefer. Files will be more difficult to open, and the storming ps themselves are vulnerable to a certain extent.

Pawns defending minor pieces gaining space advantage on the 5th and 6th ranks
Own pawns defending minor pieces gaining space advantage on the 5th and 6th ranks are due some additional bonus points (but the points might also be assigned to the pieces), as this could have consequences both in terms of tactics, as well as of the length of time the minor piece will spend into the enemy camp.
+2cps for any such p defending a piece on the 5th rank
+4cps for any such p defending a piece on the 6th rank

Attacking a medium pawn when fixed
Attacking an enemy medium pawn, part of a diagonal connection, when it is fixed, with an own pawn, should score some bonus, because this will threaten the integrity of the connection.
+3cps in such a case

+6cps when the medium p is part of the enemy king shelter, as this will expose the king

Minors part of the own immediate king shelter on squares of opposite colour to the square of the king
Minor pieces that are part of the own immediate king shelter should score some additional bonus in case they are placed on squares opposite the colour of the square the king is placed on (eg. wkg1,wnf1, or wkh1,wbh2), because such an arrangement will gain in terms of complementary control of squares.
+5cps for any such piece

Bishop with more than one own pawns on the same diagonal
When a bishop occupies a diagonal with more than one own ps on it, each p after the first will get a penalty. The side with the bishop will need time to make this diagonal a more appropriate location for the bishop, or transfer it to another diagonal.
-3mps for any such p

Number of horizontally adjacent pawns on the same rank
Any number of ps horizontally adjacent on the same rank (eg. wpsg3,f3,e3) will get some small bonus because of flexibility.
+2cps for 2 such ps
+3cps for 3 such ps
+4cps for 4 such ps, etc.
The initial position might or might not be considered.

Attacking ps defended by own ps
Pieces attacking enemy pawns defended by other ps will score naturally lower.
1/2 the standard value, if the attacked p is defended by just one p
1/3 the standard value, if the attacked p is defended by 2 ps

Pieces defending an own p making an enemy p semi-backward
Such pieces are due some bonus, as this might have some implications in the case the semi-backward p advances.
+1cp for any such piece

Pieces attacking an enemy p making an own p semi-backward
Such pieces are due some bonus, as this might have implications in the case the semi-backward p tries to advance and comes into clash with the semi-backward-maker.
+5mps for any such piece

Number of own ps controlling squares on a semi-open file
The number of own ps controlling squares on a semi-open file will matter in terms of the extent of control over the file.
+2cps for any square along the file controlled by a p
double that, in case the same square is controlled by 2 own ps

Restricted mobility of pieces part of the immediate king shelter
Any piece that is part of the immediate king shelter with less than 2 mobile squares at its disposal will be due some penalty, as such pieces are not an optimal shield for the king, because of bad functionality and congestion considerations.
-5cps for any such piece

Pieces attacking enemy pieces attacking the own king shelter
Pieces attacking enemy pieces attacking the own king shelter will be due higher bonus than normal piece attacks (by 1/3 higher), because this could have some important implications for the security of the own king. Actually, such attacks are more efficient way of defending the own king than defending attacked shelter squares, because own pieces doing this will usually retain very good activity, while caring at the same time for the well-being of the king.

Pawns of the immediate king shelter when horizontally adjacent to the square where the king is and in front of it
Pawns of the immediate king shelter that are in front of the king are usually more valuable, because they bear the brunt of enemy attacks.
1/3 lower value for ps that are horizontally adjacent to the king, regardless of the placement of the king

Bishop in front of knight on a diagonal
Bishop in front of own knight on a diagonal will score a very small bonus (+1cp), as this is an optimal way of coordination of the two pieces when they are on the same diagonal.

Stupid variations that could be aborted right away
- 3 pawns down in material and less than 3 own pieces attacking the enemy king position.
No mate and no material, what to play for

- Less than 2 pairs of own pawns that are either horizontally or diagonally adjacent to each other.
The pawn structure looks beyond repair in the foreseeable future. (but that would be considered only in the middlegame)

- Enemy has 3 more objects gaining space advantage (pawns and minor pieces on the 5th and 6th ranks) than you.
It is difficult to reverse the trend for a prolonged period of time.

- Not a single piece defending another own piece.
There must be something wrong with such a position, I do not know.

- Enemy has 2 more pieces positioned in the wider center than you.
Playing with a big number of decentralised pieces could not be justified.

- The overall mobility of the enemy exceeds yours by more than 4 mobile squares.
It is difficult to imagine that you can have a decent play when the enemy enjoys such a big advantage in mobility. And with time, the advantage is bound to only grow.

Piece immediately in front of own p vertically with an enemy minor piece gaining space advantage on the 5th rank that could be attacked only by the said pawn
Eg. wnc5, bpb7, bqb6 Staying in the way of the pawn to try and expel the intruder is not the wisest of strategies.
-1cp for such an arrangement

Doubling queen and rook on the 6th rank
Doubling queen and rook on the 6th rank, whenever possible, should score a decent bonus, as the enemy king shelter could be under severe threat.
+20cps for such an arrangement

The queen on files, ranks and diagonals
Considering values for the queen on open files, ranks and diagonals will be important not that much in terms of control of those lines, but in terms of ability to quickly transfer to an appropriate location.
An open rank will be a rank with no own or enemy pawns and pieces on it.
An open diagonal will be a diagonal with no own or enemy pawns and pieces on it. In the case of the queen, only diagonals consisting of at least 6 squares will be considered.

+15cps for a queen on an open file
+15cps for a queen on an open rank
+12cps for a queen on an open diagonal

+20cps for a queen on an open file against the enemy king position
+10cps for a queen on a semi-open file against the enemy king position

Calculating mobility in terms of different pieces
I think this is extremely important.
I am not sure how many engines do that.
Not all pieces will get same values for available mobility squares.
While the bishop and the rook will get standard values, the knight and the queen will get 1.5 times higher values. So, if a bishop gets 10cps for each available free mobile square, the rook will also get 10cps, but the knight and the queen will get 15cps instead. What is the reasoning behind this?
The knight will get 1.5 times higher value because of control of complementary squares, not accessible to other pieces. In the initial position on the board, if we acknowledge that the queen shares the capacities of the rook and the bishop, there are 3 rooks and 3 bishops, but only 2 knights, so that the moves of the knight, that control complementary squares to the squares controlled by the diagonal and linear pieces, are 1.5 times more important, as complementarity has a direct bearing on mobility.
Concerning the queen, it shares the capacities of the rook and the bishop, so complementarity is not the issue here, but the ability to quickly transfer to different locations on the board, which constitutes mobility in its essence with a time dimension. On each move the queen has the option to choose between 2 alternative ways of going: either along a diagonal, or along a line. This makes it going 2 times faster than other pieces. But, although it can choose between one of 2 ways to go, on each move it can go in only one direction; it can go 2 ways, but chooses in reality only one. That makes its moves 1.5 times more valuable than those of other pieces, because, although it chooses only one way, it can do so going in a variety of directions, which makes it more easier to span the board. The higher value is due to superiority in mobility with a time dimension.
Those values are much more precise, in my understanding, than having all pieces get the same values for available mobile squares. The difference should not be all that overwhelming, but with quite real impact on board events in a wide range of situations, difficult to track if scoring mobility for all pieces in the same way.

Why pins are so important

Pins are really important, because both the pinned piece and the other own piece at the other end of the pin lose mobility in such a situation, and mobility is, at the end of the day, strength. When a piece is pinned, it usually can not move without suffering material losses, and the same, to a varying extent, is usually true for the piece at the other end of the pin; many possible moves will lead to damaged pawn structure, for example. In this way both pieces for the pinned side are crippled in terms of mobility and you will need time to free yourself from the pin.

Therefore, pins are to be avoided whenever possible.

The same logic will be more or less true for x-ray attacks.

King pins are even more forceful in this respect, because in this case the pinned piece can not move at all, i.e., it has zero mobility for the specific point of time, its strength being very low or non-existent. To extricate from the pin without compromising on material or other issues will be very difficult, and you will need time for this.

The situation with the king at the other end of the pin having no free available mobile squares is even more dramatic, because one of the options for extrication from the pin, moving the king away from the pin, is not there. Time considerations will be even more important in this case.

2 king pins at the same time will be extremely forceful, because the pinned pieces can not move, have zero mobility, their actual strength being very low or non-existent at all, and the enemy will need a vey small amount of additional strength to try and force a win; the enemy is in reality much superior in material.

One of the most forceful pins ever is queen pinning a piece with the enemy king at the other end of the pin and just one square in between the queen and the enemy king (eg. wqe6, bke8, bbe7). The queen is not only incapacitating the enemy piece, but it is also controlling 2 of the squares (f7 and d7 in the specific case) where the king could go to free itself from the pin.