

forced winner and aggressive margin

In remembrance of William R. Jacobson

Craig O'Shannessy is the most popular tennis analyst on this planet and with his two year engagement for the team of Novak Djokovic he is at the peak of his career.¹

In September 2019 he announced a strategic partnership with a company which helps "uncovering valuable information about opponents that I quite simply could not have dug up myself" Craig said. These guys use Artificial Intelligence "and advanced reporting to look at our sport in a new way."²

In the same month Craig announced his partnership with "the leading tennis tagging company in the world"³ - with its founder Warren Pretorius has been working a number of years together.

The German *tennis magazin* published in its first issue 2020 an article which was announced as "Cyber-Tennis" on the front cover of the magazine and "Cyber court" inside – the subject is **Big Data** for coaches and players.⁴ Announced as a subject which will change the tennis sport. And on *tennis.com* you can find in January 2020 an article about today's role of Statistics in modern day tennis.⁵

Which big meaning **Big Data** can have we experienced on 7. January 2017 when at the International Tennis Meeting of the German Tennis Federation the trainer Björn Simon held a lecture about tennis statistics and Davis Cup Captain Michael Kohlmann presented some consequences for training.

Their presentation founded mostly on Craig's statistics and a statement

**"... that 7 of 10 points ended with an error,
that, I believe, is a massive statistic ..."**⁶

Which Craig said in a newsletter

Tennis is approximately 70% errors.

¹ Barschel (2019), Tignor (2020)

² O'Shannessy (2019a)

³ O'Shannessy (2019b)

⁴ Zirinski (2020)

⁵ Tandon (2020)

⁶ German original: „..., dass 7 von 10 Punkten mit einem Fehler beendet werden, das, glaube ich, ist eine massive Statistik ...“ (Kohlmann/Simon, 2017)

We found on Craig's webpage with regards to the Australian Open 2015 that this statistic applies to 70% in men's and 74% in women's tennis.⁷

Furthermore Michael Kohlmann said

“..., that only 3 winners were played. I have worked with Rudi Molleker now for 8 months; if you tell him, from 10 points only 3 winners were played, he will laugh at you. Because, he has the feeling, he has played 7 winners, thus exactly the opposite.”⁸

We hear the Davis Cup Captain telling about “**massive statistics**” and about a “**feeling**” one of his trainees has.

What is a “feeling” of a young upcoming tennis pro against “massive statistics” ?
Maybe worth something but probably not the whole truth.

But this is the big fallacy !

Craig and Michael/Björn are wrong and Rudi is right !

The truth is

Tennis is approximately 70% winners.

Craig's definition *Tennis is approximately 70% errors* guides him to the conclusion “The reality of tennis, at all levels of the game, is that players beat themselves much more than their opponents do.”⁹

If you look at the truth, this conclusion is wrong: the *forced error* does not have to blame the player who misses, but should praise the player who forced the point !

Thus a *forced error* is actually a **forced winner**¹⁰ and *tennis suddenly becomes approximately 70% winners*.

⁷ If you watch the right column where he announced his products for the „25 Golden Rules of Singles Strategy“. [23.01.2020]: <https://www.braingametennis.com/the-most-important-number-in-tennis/>

Look also at O'Shannessy (2016) for the US Open 2015.

⁸ German original: „..., dass wirklich nur 3 Winner gespielt werden. Ich hab' jetzt 8 Monate mit dem Rudi Molleker gearbeitet; wenn Du dem das sagst, von 10 Punkten werden nur 3 Winner gespielt, der lacht Dich aus. Weil, der hat das Gefühl, er muss 7 Winner spielen, also genau das Gegensätzliche.“ (Kohlmann/Simon, 2017)

⁹ O'Shannessy (2016)

¹⁰ “...forced errors are of equal importance to winners and probably should be labelled something other than >>forced errors<<.” [21.02.2020]: <https://gtstats.net/players-and-parents/tennis-stats-forced-unforced-errors/>

This is how Craig views the statistic ¹¹:

4 Grand Slams 2015			
	winners	forced errors	unforced errors
women	29	37	34
men	32	41	27

This is how I use the statistic:

4 Grand Slams 2015			
	winners	forced winners	errors
women	29	37	34
men	32	41	27

The numbers are the same – but the **qualitative message** is totally different ! ¹²

But it's not only to switch the term *forced errors* to *forced winners*. There is a **consequence for the statistical scorekeeper**: instead of naming the last missed shot they have to name the forcing shot before. If player B misses with a "backhand passing shot forced error" the statistician has to note the forcing action of player A beforehand which was for example an "inside out forehand forced winner". A crucial change in statistics!

The statisticians from *Tennis Analytics* are working this like.¹³

¹¹ Source is Craig's website [23.01.2020]: <https://www.braingametennis.com/the-most-important-number-in-tennis/> - the advertising block for his package „NUM3ERS“

¹² Compare Eberhard (2017, addendum 7)

¹³ Personal e-mail from Warren Pretorius on 20.03.2020.

In 2018 Björn Simon repeats his statistical view on tennis. First he admits himself as a follower of the concept and the conclusions of Craig O’Shannessy which includes not to differentiate between *forced* and *unforced errors* – they should only be called *errors* he said ¹⁴ – second he states 71%/68% errors for the ATP Grand Slams 2012/2015 and 74%/71% errors for the WTA Grand Slams 2012/2015 ¹⁵, third he says:

“...it is unbelievable that these statistics are not anchored in how we look and study Tennis and dictate how we play and look at the game.” ¹⁶

I have to retort:

Why is it not possible to teach game observers that they get a better interrater reliability by judging the differentiation between *forced* and *unforced errors* or better between *forced winners* and *errors*? ^{17, 18}

Weber and his colleagues reached for their research a high interrater reliability.¹⁹
Finally Weber said:

¹⁴ Something Craig emphasizes in an interview with the german *tennis magazin* in September 2019 as well: “>>They are completely senseless. Eliminate them, that would change our sport for the better. We attach to much importance on unforced errors and not enough on forced errors. For me that is the most important criterion in modern tennis. It’s a joke, that forced errors in many statistics are not recorded<<, criticized the Australian.”

German original: “>>Die sind komplett nutzlos. Schafft sie ab, das würde unseren Sport zu einem besseren machen. Wir legen viel mehr Wert auf einen unerzwungenen Fehler und nicht genug auf einen erzwungenen Fehler. Für mich ist es das wichtigste Kriterium im heutigen Tennis. Es ist ein Witz, dass erzwungene Fehler in vielen Statistiken gar nicht erfasst werden<<, kritisiert der Australier.“ (Barschel, 2019)

¹⁵ Kohlmann/Simon (2017); Simon (2018: 40)

¹⁶ German original: “Es ist unglaublich, dass diese Statistiken/Zahlen nicht bereits fest verankert in unserer Betrachtung der Sportart Tennis sind und nicht komplett diktieren, wie wir diesen Sport sehen und spielen.“ (Simon, 2018: 40)

¹⁷ Simon said 2017 in his lecture

“If you ask ten trainers at a Grand Slam to examine the same point, five of them will say ‘That was an unforced error’ and the other five ‘That was a forced error’.”

German original: “Wenn Du beim Grand Slam zehn Trainer hinsetzt und lässt denselben Punkt begutachten, dann sagen fünf ‚Das war ein unerzwungener Fehler‘ und fünf sagen ‚Das war ein erzwungener Fehler‘.“ (Kohlmann/Simon, 2017)

¹⁸ How the numbers are generated we read here: “A part-time statistician or student sits on the side of the court and evaluates the game style, execution, technique and tactical battle between professional players and decides what’s forced and what’s unforced.” (O’Shannessy, 2018)

¹⁹ Weber et al. (1982: 156f), Weber (1987: 23)

“Our results have contributed, to establish a systematic game observation as a main objective diagnostic proceeding for technical-tactical benefits in tennis under competition conditions.”²⁰

Craig and Björn capitulate against the subjectivity instead of asking for a better teaching of game observers who should have a different and better understanding of the game.

And they capitulate against the big data companies instead of changing them.^{21, 22}

Because of their capitulation they are supporting the message to their audience that approximately 70% of points are errors.

But in fact approximately 70% of points are winners.

That makes a huge difference!

Let’s take a step back.

Leo Levin, who invented 1982 tennis statistics for television and as a coaching aid, said 2013:

“>>We had the concept of a shot that is ‘forcing’ or just ‘in-play,’<< Levin said. >>So if players are trading what we consider to be ‘in-play’ or neutral shots, a resulting error would have to be unforced. <<

Though a winner (a shot that lands in the court and is not touched by the opponent) is easy to determine, deciding whether an error is forced or unforced is subjective. And when more than one statistician is working a match — usually one for the tournament and one for the broadcaster — their totals can differ drastically.

²⁰ German original: „Unsere Befunde haben dazu beigetragen, die systematische Spielerbeobachtung als objektives diagnostisches Hauptverfahren für technisch-taktische Leistungen im Tennis unter Wettkampfbedingungen zu etablieren.“ (Weber, 1987: 214)

²¹ „Forced errors are left off because they are seen as ambiguous or unimportant.“ (O’Shannessy, 2018)
When they don’t display on TV the number of *forced errors* because they are too ambiguous, why do they display *unforced errors* if they are exactly the same way too ambiguous ?

²² Leo Levin has an interesting idea, why the media does not take notice of the *forced errors*:
“>>Unforced errors and winners are more glamorous,<< Levin said. >>They’re easier to spot; there’s more of a story there a lot of the time. And one of the things we learned as we developed the stats, especially as you deal with media and broadcasters: they’re trying to paint pictures; they’re trying to tell stories.<<

>>And it’s easier to tell a story with ‘He made 20 unforced errors; he’s giving away a lot of points.’ You can articulate that really easily. Or if he’s hitting a lot of winners, it’s flashy shots. Again, it creates a buzz. But if you talk about ‘He’s forcing a lot of mistakes,’ it doesn’t have the same appeal. <<” (Rothenberg (2013))

According to Information and Display Systems, a player commits an unforced error if he does not keep a ball in play though he is >>under physical pressure as a result of the placement, pace, power or spin of their opponents stroke. <<”²³

And further more:

The history of the unforced error can be traced to 1982, when Leo Levin, who played at Foothill College in Los Altos Hills, Calif., decided to chart his teammates’ matches. **He tracked the errors they were making and the errors their opponents were forcing them to make.**

“That concept of forced and unforced errors kind of came into being around that time, and then I got hired on by a company that was starting to develop the first computerized stats system,” Levin said in a recent interview at Roland Garros.

He is now the director of sports analytics for SMT, which collects data at all four Grand Slam tournaments.

“We came up with a concept saying that every point ended in one of three ways,” Levin said. “A winner, a forced error or an unforced error, and every single stroke, every single result, fit into one of those categories.”²⁴

Here we have the origin of the misconception *forced error*.

When there are “**errors their opponents were forcing them to make**”, then they are not to blame for the error because they are **forced!**

Instead the opponent should have that shot on his account as a ***forced winner!***

For some reason Leo Levin switched the forcing aspect to the player who is suffering due to the forcing action of his/her opponent and coming up with the differentiation of *forced* and *unforced error*. Instead he could leave the forcing aspect with the player who did the forcing shot and then he would come up with the concept of *winner* and *forced winner*.

²³ Rothenberg (2013); I have never seen a definition of *winner*, *forced* or *unforced errors* on television or on official websites from the Grand Slam tournaments. Another definition to differentiate between *forced* and *unforced errors* (Dougherty 2014): “if the incoming ball causes an error by taking time and/or balance from the player, the error was forced. If time and/or balance are not compromised by the incoming ball, the error was unforced.”

²⁴ (O’Shannessy (2018); my accentuation)

On one hand it's funny to look at on the other hand it's tragic that Leo and Craig can see this, but don't take any steps to change their statistics – they are prisoners in the cage of their terminology. You can watch them by thinking, here Levin:

“You'll see that a lot of times when a player like Serena Williams loses a match,” he said. “It's not usually because she got overpowered; she was the aggressor, but she was making mistakes. So unforced errors are typically a key factor for her when she loses. But when she wins, she's not winning because her opponents are making mistakes, she's winning because she's dominating by forcing mistakes and hitting winners.”²⁵

“What we are trying to do is place the blame, first and foremost,” he said. “Any time there is a forced error, the preceding shot has to be an aggressive forcing shot.”²⁶

“A forced error is much closer to a winner than it is to an unforced error. An unforced error is a situation you are completely in control and you make the mistake.”²⁷

We see, Levin has a clear understanding of what's really going on, but he is not able to switch to the term **forced winner**. As a solution he comes up with a seemingly new term called *aggressive ratio*:

So what's the alternative? One answer is to just count winners and errors, no forced or unforced. Another is to throw away the current statistics and come up with something new to evaluate aggressiveness and consistency.

Levin suggested an “aggressive ratio,” which gives a player credit for forcing errors, rather than counting against the player who makes the error.²⁸

But this idea is not new.

William R. Jacobson invented at the end of the 1980s a **Personal Improvement Chart** (PIC) for ambitious tennis players. This chart should inform how far a player won a match because of less errors or because of making points. His formula was:

Winners + Opponents forced errors – Your unforced errors²⁹

²⁵ Rothenberg (2013)

²⁶ O'Shannessy (2018)

²⁷ O'Shannessy (2018)

²⁸ O'Shannessy (2018)

In new terminology:

Winners + Forced winners – Errors

The result of his formula Jacobson called **aggressive margin** which informs about the person who has “Match Control”.³⁰

And for measuring the *aggressive margin* we need to differentiate between *forced winners* and *errors*.

The German Tennis Federation had for many years a scientific advisory committee. They started yearly symposia in the 1980s. In the documentation of the 4th symposia at 1989 we find the articles

*A fresh approach to player development – measuring and monitoring a player’s improvement*³¹

*Strategic and tactical choices in tennis*³²

The first article was published in *The Tennis Pro* (USPTR magazine), *AddVantage* (USPTA magazine) and *tennis magazine*.

And for Craigs’ new concept – the *Match Intelligence Report* with positioning data of winners and errors, which is announced as *The analytics revolution*³³ – take a look to the work of Karl Weber, Alexander Ferrauti and others between 1982 and 1995.³⁴

Karl Weber and his colleagues reviewed 394 players in 197 singles and 52 players in 13 men’s doubles. They collected 600.000 single data of 150.000 stroke actions.³⁵ For his sports medical habilitation treatise Weber collected between 1978 and 1982 handwritten data from 13 doubles and 78 singles. The data of 119 singles between 1982 and 1984 he recorded with a computer, before Weber and his colleague Bochow then gave their demands to an engineering company which programmed a software. At that point in time there were no computer aided systematic game analytics in tennis; there was just an unpublished

²⁹ Jacobson (1990a: 63)

³⁰ Jacobson (1990b: 74)

³¹ Jacobson (1990a)

³² Jacobson (1990b)

³³ Newsletter of Will Hamilton (Fuzzy Yellow Balls), 14.12.2019

See also Tignor (2020) for Craigs *analytics revolution*

³⁴ Weber et al. (1982), Weber (1987), Weber/Bochow/Ferrauti (1987), Ferrauti (1992), Bernwick/Müller (1995a, b)

³⁵ Weber (1987: 191)

manuscript from USA.³⁶ The analytics of the handwritten data taken for both players in one singles between which took 6-10 hours to evaluate. With the computer aided data the evaluation time was reduced to 30-90 seconds.³⁷

Important parameters in the resulting presentation are for Weber the *quality ratio* (the relationship of winning and missing strokes) and the quality difference,³⁸ which the team of authors named *success ratio* and *success difference*;³⁹ thereby *quality ratio* and *success ratio* comply with the basic idea of the *aggressive margin*.

Additionally take a look at papers which Weber published 2010 and 2012⁴⁰ while Paul Annacone, Todd Martin and Craig O'Shannessy stated at the *Sloan Sports Analytics Conference (SSAC)*⁴¹ the insignificance and the missing further development of statistics in tennis and Craig pointed to the significance of the first four strokes.

Five years earlier, between 22.-28.10.2007, Karl Weber hold the lecture "New data for physiological and technical demands in professional clay court tennis *with recommendations for higher quality in training*" and pointed to the high importance in training the first four strokes: serve, return and the first stroke after that – the occasion was the 15. ITF Worldwide Coaches Conference in Asuncion (Paraguay).

By the way Josef Brabenec had already pointed out in 1994 backed by statistical evidence, the importance of the first six strokes.⁴²

Nevertheless Bernwick/Müller pointed out in 1995 the relevance of being capable to play steady baseline strokes:

The performance relevance of the profitable use of groundstrokes is strongly related to the ATP world ranking. The worse the ranking the more ineffective the baseline game appears. [...] predominant TOP 10-players are able to play and successful finalizing longer rallies from the baseline on fast surfaces.⁴³

³⁶ Weber (1987: 190)

³⁷ Weber (1987: 193)

³⁸ Weber (1987: 196)

³⁹ Weber/Bochow/Ferrauti (1987: 240)

⁴⁰ Weber et al. (2010a, b), Weber/Born (2012)

⁴¹ *Sloan Sports Analytics Conference (SSAC)* at MIT in 2012, [24.01.2020]:

<https://www.youtube.com/watch?v=QPvYJbKjmaw>

⁴² Brabenec (1994a, b)

⁴³ German original: Die Leistungsrelevanz der gewinnbringenden Anwendung der Grundlinienschläge ist stark signifikant abhängig von der Platzierung in der ATP-Weltrangliste. Je schlechter die Platzierung, desto

How is the situation in 2020 among the big three in tennis?

Djokovic began in 2013 to work with Warren Pretorius using tennis stats. In 2017 he hired Craig for his team who helped him to win four Grand Slam titles in the years 2018 and 2019⁴⁴; at the end of 2019 they parted ways.⁴⁵

Federer uses statistics but not so often as Djokovic and says:

"I think sometimes it can be very useful against certain player types. Sometimes I honestly think it's very misleading. You have to be very, very careful how you use it.

[...]

I remember times where I looked at nothing other than how am I going to play. I don't even care how my opponent plays. You can really go about it in many different ways. But I think sometimes it is quite interesting to look at the statistics." ⁴⁶

"... Federer – who is understood to pay more than double the standard rate in order to secure exclusive access to GSA's services for as long as he remains in a tournament" ⁴⁷

"Rafael Nadal's team say that they use no outside agencies, only the analytical mind of his coach Carlos Moya," ⁴⁸

Brad Gilbert, former coach of Andre Agassi, says:

"I like analytics, and I like what Craig does

[...]

Most points might be short, but what if you're [David] Ferrer or [Simona] Halep, someone who wins with their legs? [...] I know Andre felt most comfortable when he wasn't making errors.

uneffektiver scheint das Spiel von der Grundlinie. [...] vorwiegend TOP 10-Spieler in der Lage sind, auf schnellen Böden längere Ballwechsel von der Grundlinie zu spielen und auch erfolgreich abzuschließen.

(Bernwick/Müller, 1995b: 24)

⁴⁴ Hamilton (2019)

⁴⁵ Tignor (2020), Hareh (2020)

⁴⁶ Tandon (2020)

⁴⁷ Briggs (2019)

⁴⁸ Briggs (2019)

[...]

The patterns tell you a lot, especially with guys in the 80 to 100 ranking range. But the best guys can break the patterns. I'm still a believer in the greatness of the human element.”⁴⁹

The German trainer Jan de Witt does not want to rely on the human element; he employs a team of video analysts and a statistician. They develop their software and optimise it. A statistic report for his players is between 17-20 pages long (or 27 pages ?!) ⁵⁰; subject is the next opponent.

“And if we succeed in winning two to four more points in a match, it was really worth the effort .

[...]

Nowadays in team games we have the situation that on national level without video analysis you are not competitive. National league in volleyball, handball or soccer are unthinkable these days without data analysis .In handball it's also used in the next two lower leagues.“⁵¹

And Ben Leloup, Co-Founder of an analytics agency, says:

“To know, which player serves out wide at break point from the deuce court, can be worth several hundred thousand dollars' of prize of money.“⁵²

⁴⁹ Tignor (2020)

⁵⁰ Jan de Witt is cited with “zwischen siebzehn und zwanzig Seiten” (*between seventeen and twenty pages*) and with “27 Seiten” (27 pages). See Zirinski (2020: 56) and Schwarz (2019b: 9)

⁵¹ German original: “Und wenn es uns gelingt, dass wir dadurch zwei bis vier Punkte im Laufe eines Matches mehr gewinnen, hat sich der Aufwand am Ende gelohnt.

[...]

Bei den Sportsportarten ist es heute schon so, dass man selbst auf nationalem Level ohne Videoanalysen nicht mehr konkurrenzfähig ist. Volleyballbundesliga, Handballbundesliga, Fußballbundesliga sind ohne Datenanalyse heutzutage undenkbar. Beim Handball werden sie sogar in der Landes- und Verbandsliga angewendet.“ (Zirinski, 2020: 56, 57)

⁵² German original: “Zu wissen, welcher Spieler bei Breakball auf der Einstand-Seite gerne nach außen serviert, kann im Zweifel mehrere hunderttausend Dollar Preisgeld wert sein.“ (Zirinski, 2020: 57)

The German top-player Alexander Zverev says:

“All the big guys are using data analysis; they just don’t like to talk about it. I use it a lot. It’s a big part of the game now. It’s helped me with game-plans and preparation for individual opponents, and it was particularly helpful at the ATP Tour Finals.”⁵³

But listen what Paul Annacone said in 2012:

“I was fortune enough to coach Pete Sampras for many years and I remember he played a match against Thomas Enquist from Sweden and he had eight breakpoints in this match and eight times he served hard to Pete’s backhand which of course I documented. So, being the studious coach that I was, I wrote all that stuff down and I told Pete that before he played the next match, and guess what ,every big point serve went exactly on the opposite side.

So, after apologizing to Pete after the match and hopefully keeping my job, he was great. He said: ‘Look, these guys have tendencies, we all do, but we are the best players in the world, we can continually change things.’ ”⁵⁴

“best players in the world ... can change things” – this is questioning for whom tennis statistics are made for.

The statistics on TV are for the audience, the statistics on the tournaments websites are for the interested fans and the statistics which trainers like Craig O’Shannessy, Björn Simon or Jan de Witt uses are for the pro players or ongoing pros.

For the ambitious recreational player it is important to know if he/she has a positive or a negative **aggressive margin** in the sense of William R. Jacobson’s **Personal Improvement Chart**.

And for the quality of the tennis statistic it’s important to make the shift from the *forced error* to the **forced winner** – we are not forcing errors, we are forcing points !⁵⁵

This includes to call for a **service forced winner** instead as *service forced error*.

⁵³ Briggs (2019)

⁵⁴ Sloan Sports Analytics Conference (SSAC) at MIT in 2012, [24.01.2020]:
<https://www.youtube.com/watch?v=QPvVJbKjmw>

⁵⁵ Simon (2018) wrote an article called *Fehler gezielt erzwingen (Forced errors)*; with a positive mindset the article would be named *Punkte gezielt erzwingen (Forced points making)*. The article describes what O’Shannessy (2018) said in short: “The eight ways to force an error in tennis are: consistency, direction, depth, height, spin, power, court position and time (taking time away for the opponent to prepare for a shot).”

A practical question is

How to generate the data to determine the *aggressive margin* ?

An ambitious recreational player does not have a video analyst or a statistician. And usually the trainer does not accompany his tournament or team during a competition and if so, it's self-evident that she/he is not collecting the data for a match statistic. Also the parents are usually not attending these occasions.

Therefore a recreational player has no chance to get statistical information on a tournament. But at the team competition she/he can ask her/his teammates to collect the information with a statistic app on their smartphone. To have a statistic of good quality it needs a scorekeeper who concentrates on the match for usually 90-120 minutes and typing every point (not every stroke!) into the smartphone, this works only with a scorekeeper who is not phoning or writing messages in between.

If you find a person who is able and willing to do that, you are very lucky:

“I have noticed that younger players particularly between 18 and 22 years of age have difficulties in concentrating for longer periods in a match. “⁵⁶

If players have problems concentrating in their own match, how hard is the task to concentrate on the teammates' game from outside the court !

An option is to install the expensive *Play Sight* system, which is used by German high performance centers⁵⁷ or a cheaper system like *Wingfield* for the ambitious club. Finally, you can record your match yourself and send the file to a company like *Tennis Analytics*, which makes you independent from your club.

But systems like *Play Sight* or *Wingfield* cannot differentiate between a forced winner and an error because the programmed algorithm for moving speed, distance covered, ball speed, placement, depth and angle⁵⁸ is different for different levels of play. It's not an easy task to find the right algorithm for every type of player.

⁵⁶ German original: “Mir fällt auf, dass die jüngeren Spieler, allen voran zwischen 18 und 22 Jahren Schwierigkeiten haben, sich über längere Phasen eines Matches zu konzentrieren.” (Zirinski, 2020: 58)

⁵⁷ Alexander Raschke wrote his thesis about the use of video for tactical diagnosis with young players aged between 10-14 years old. (Raschke, A./Lames, M., 2019)

⁵⁸ O'Shannessy (2018) : “The typical things we look for are pace of the previous shot, placement, both depth and angle, how far did the player have to run to get there, and also what direction was he going.”
How to program a camera system with connected software which uses these parameters for deciding if the shot was a *forced winner* or an *error* of the opponent ?

For a company like *Tennis Analytics* it's easier to decide because a person is tagging your video and decides over errors and winners – you should ask them if they judge and count with the category *forced winner*.

It's easier to judge for your teammate if you forced a winner or if your opponent did an error and vice versa because he/she knows your style of play. Ambitious club players should tag each other when they have their team competition with a statistic app.⁵⁹ If you do that every six months during a match with an opponent who has your level of play it will support your improvement.

What makes the difference between **technical coaching** on club level and *technical coaching* on tour level demonstrates the following statement of Jan de Witt:

“If the backhand isn't working well, the opponent will continue to play there until my player either finds a solution or loses. Therefore, it's my task to detect this problem early and find a solution. As we usually do not have more than one training session, I have to be able to correct a motion pattern within one hour so that the player can rely on it for the next match. Which might be the next day before 10.000 spectators and millions of TV-viewers. This is my job.”⁶⁰

What makes the difference between **tactical coaching** on club level and *tactical coaching* on tour level is demonstrated in the following statement from Craig O'Shannessy:

“When people watch the elite players – Roger, Rafa or Novak – they think the result is much more down to their play and their patterns,” O'Shannessy told *The Telegraph*. “But there's a hidden game going on against each opponent where they know the weaknesses so they're modifying and adjusting their game plans much more than the average person would realise.”

⁵⁹ “GT STATS is the only tennis stats app that credits forced errors **to the player who forced the error**, not the player who made the error.” [21.02.2020]: <https://gtstats.net/players-and-parents/tennis-stats-forced-unforced-errors/>

⁶⁰ German original: “Wenn die Rückhand nicht richtig funktioniert, wird der andere solange dorthin spielen, bis mein Spieler eine Lösung gefunden oder verloren hat. Also ist es meine Aufgabe, das Problem frühzeitig zu erkennen und eine Lösung zu finden. Da wir normalerweise nicht mehr als eine Trainingseinheit haben, muss ich in der Lage sein, ein Bewegungsmuster innerhalb einer Stunde zu korrigieren, dass es wettkampffest ist und er in der Lage ist, es am nächsten Tag vor 10.000 Zuschauern und Millionen TV-Zuschauern zu bringen. Das muss ich können.” (Tipp, 2019)

“The Big Three do it more than the other players. Further down the list, the players tend to focus on what they do and the patterns they want rather than what’s going on the other side of the court and understanding their opponent.”⁶¹

The club player has to develop his own game patterns; it makes sense to analyze how their own patterns work. The pro player has developed several own game patterns; for him it also makes sense to analyze the opponents patterns to decide how to answer them.

“My common sense tells me, that, if I know exactly, which kind of return my opponent does not like and what kind of serve is a problem for him, I can develop a clear advantage,” says de Witt.⁶²

To understand what a pattern can look like, follow this explanation:

One popular idea is the “stat tree”, which shows where a player is most likely to hit the ball from each position on the court. It’s then relatively simple to create two-shot patterns to exploit your opponent’s weaknesses.⁶³

For example, let’s say a player hits 50 forehand winners in several matches in a tournament...

- and 40 of the 50 came when he started the point serving.
- and 35 of the 40 came in a 3 shot rally.
- and in that 3 shot rally, 90% were Serve +1 forehand.
- and 95% of those forehands originated out of the Ad court (Baseline positions C and D).

As you can see, it’s all about drilling down. It’s also about adding layers, such as point score, rally length, serve location, baseline location and how you start the point. We mine more data from the 0-4 rally length than anyone on the planet!⁶⁴

⁶¹ Briggs (2019)

⁶² German original: “>>Mein gesunder Menschenverstand sagt mir, dass, wenn ich genau weiß, welche Art von Return meinem Gegner nicht liegt und welche Art von Aufschlag ihm Probleme bereitet, ich mir damit einen klaren Vorteil erarbeiten kann<<, sagt de Witt.“ (Zirinski, 2020: 58)

⁶³ Briggs (2019)

⁶⁴ O’Shannessy (2019a)

These days pro players pay the data companies for hiding their game data from their opponents:

The leading agencies in this growing market include Tennis Stat and Golden Set Analytics. They are pitching for new work within the women's game, where the idea has not yet caught on to the same extent, and quoting sums of £80,000 or more for an annual package. If you want an exclusive deal – in which your rivals cannot access the same company's services – then the fee rises further. ⁶⁵

Coming down to earth to the ambiguous recreational player the main message of Craig is that we should practice more ⁶⁶

- serve and return
- serve +1 shot and return +1 shot
- serve + forehand and return + forehand
- attacking the second serve
- approaching the net

Just do it 😊

⁶⁵ Briggs (2019)

⁶⁶ O'Shannessy (2016), Tandon (2020), Tignor (2020)

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