**Sentiment / Emotion Analyse von Charakteren, Charakterbeziehungen und Musik im Filmverlauf**

**Fragestellung(en) / Thema:**

Wie entwickeln sich die Emotionen eines Charakters im Filmverlauf?

Wie entwickeln sich die Beziehungen von den Hauptcharakteren untereinander im Filmverlauf?

Wie passen die Emotionen (Valence / Arousal Level) der Filmmusik zu den dialogbasierten Sentiments / Emotionen? Lässt sich ggf. ein bestimmter stilistischer Einsatz von Filmmusik an gewissen Stellen ableiten?

**Analysemethode(n):**

* NLP / Text Mining für die Korpuserstellung
* lexikonbasierte Sentiment Analyse

**Korpus / Datensammlung:**

* **Daten**

Movie Scripts: <https://www.imsdb.com/> (primär)

Film Music Timestamps: <https://www.soundtrackradar.com/movie-soundtracks/>

(ca. 270 Filme, inkl. Musikverlinkungen zu YouTube)

Komplette Tonspuren von Filmen: <https://www.listentoamovie.com/media/index.php>

(Format mp3 Files, 36GB Material für Movies)

* **Sentiment / Emotion Analyse Lexika**

NRC Valence, Arousal, and Dominance

(NRC-VAD) Lexicon <http://saifmohammad.com/WebPages/nrc-vad.html>

NRC Emotion Intensity Lexicon (NRC-EIL) <http://saifmohammad.com/WebPages/AffectIntensity.htm>

* **APIs für Audiodateien mit Features**

Spotify API <https://developer.spotify.com/documentation/web-api/reference/tracks/get-audio-features/> <https://developer.spotify.com/documentation/web-api/reference/tracks/get-audio-analysis/>

AcousticBrainz API [https://acousticbrainz.org/data#api-reference](https://acousticbrainz.org/data" \l "api-reference)

+ more Metadata <https://musicbrainz.org/>

Gespräch mit Manuel, 03-06-20

* Fokus auf Sentiment Arcs
* Nutzen von Soundtracks und Text für den gesamten Filmverlauf
* Charakterbasiert in Stufe 1 zu kompliziert
* Einteilung in Musik, Dialog, Szenenbeschreibung?
* Als Begründung für das Weglassen der genauen Timestamps  Paper zu Arc Plots heranziehen
* Gibt es Unterschiede bei Genres?
* Gibt es Unterschiede bei Komponisten?
* Betrachtung von Genres und ggf. Komponisten vorstellbar
* Next steps:
  + Paper nochmal lesen
  + Korpus erstellen
  + Pipeline entwerfen

19-06-20

**Korpus?**

Ich brauche:

* Soundtracks
* Skripte

Welche Soundtracks?

**Variante 1:**

* Ausgehend von der Suche nach "Original Motion Picture Soundtrack" die Alben scrapen
* Liste mit Alben:

[https://open.spotify.com/search/%22Original%20Motion%20Picture%20Soundtrack%22/albums](https://open.spotify.com/search/"Original Motion Picture Soundtrack"/albums)

* Kategorisieren / schauen was dann vorhanden ist
* Die Skripte zu den Filmen heraussuchen

Vorteil: Einfache Spotify Suche, die offizielle Soundtracks von vielen Blockbustern wiedergibt

Nachteil: Stichprobenartig zu vielen Soundtracks keine Skripte gefunden. Gezieltes Scrapen von Skripten erforderlich.

*The contraction****soundtrack****came into public consciousness with the advent of so-called "soundtrack albums" in the late 1940s. First conceived by movie companies as a promotional gimmick for new films, these commercially available recordings were labeled and advertised as "music from the original motion picture soundtrack", or "music from and inspired by the motion picture." These phrases were soon shortened to just "original motion picture soundtrack." More accurately, such recordings are made from a film's music track, because they usually consist of isolated music from a film, not the composite (sound) track with dialogue and sound effects.*

<https://en.wikipedia.org/wiki/Soundtrack>

**Variante 2:**

* Filme nach Genres oder Komponisten suchen
* Dann via Spotify nach deren Soundtracks suchen:
  + Liste mit Filmtiteln in die Suche eingeben

Vorteil: Korpus ist von vornherein etwas kontrollierter und begrenzter

Nachteil: Spotify Suche wird komplexer  vermutlich nicht jeder Film hat „Original Motion Picture Soundtrack“ als Zusatz bzw. Ergebnisse müssen weiter gefiltert werden

 Schauen, wie viel übrig bleibt?

<https://www.imdb.com/feature/genre/>

Possible Top 50 Feature Films sorted by Popularity per Genre (more also possible)

|  |  |
| --- | --- |
| [Romance](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Romance&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (45.963) | [Drama](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Drama&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (25.866) |
| [Comedy](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Comedy&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (15.644) | [Action](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Action&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (4.284) |
| [Adventure](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Adventure&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (3.221) | [Crime](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Crime&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (2.898) |
| [Thriller](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Thriller&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (2.567) | [Musical](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Musical&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (2.505) |
| [Fantasy](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Fantasy&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (1.760) | [Music](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Music&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (1.614) |
| [Mystery](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Mystery&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (1.596) | [Family](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Family&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (1.456) |
| [Western](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Western&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (1.437) | [War](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=War&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (1.418) |
| [History](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=History&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (1.049) | [Horror](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Horror&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (795) |
| [Biography](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Biography&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (776) | [Sci-Fi](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Sci-Fi&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (666) |
| [Sport](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Sport&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (605) | [Documentary](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Documentary&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (506) |
| [Animation](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Animation&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (326) | [Film-Noir](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Film-Noir&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (138) |
| [News](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=News&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (16) | [Reality-TV](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Reality-TV&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (10) |
| [Adult](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Adult&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (1) | [Short](https://www.imdb.com/search/title/?title_type=movie&genres=romance&genres=Short&view=simple&explore=title_type,genres&ref_=adv_explore_rhs) (1) |

Example Links:

**Top 50 / 100 Romance**

Seite 1

<https://www.imdb.com/search/title/?genres=romance&view=simple&explore=title_type,genres&title_type=movie&ref_=adv_explore_rhs>

Seite 2

<https://www.imdb.com/search/title/?title_type=movie&genres=romance&view=simple&start=51&explore=title_type,genres&ref_=adv_nxt>

 hrefs zu den imdb Einträgen der jeweiligen Filme

 weitere imdb Auskünfte können gezogen werden

Note: Ein Film kann mehreren Genres zugeordnet sein!

Creating new Environment:

* BeautifulSoup
* JupyterLab

And everything that comes with it

**zu Variante 2: Skripte von imsdb ziehen**

**Other Sources:**

A website linking to movie scripts, last updated 2007: <http://moviescriptsandscreenplays.com/>

Some overall thoughts about different roles of music in film: <https://www.epidemicsound.com/blog/music-and-emotion/>

PMEmo Dataset for Music Emotion Recognition (including references to other MER datasets)

<https://github.com/HuiZhangDB/PMEmo> (not sure if dataset is still available, but there are some Notebooks for inspiration, usage)

<https://dl.acm.org/doi/epdf/10.1145/3206025.3206037>

Links von Burghardt zu Sentiment and Emotion Analysis to read: <http://www.zfdg.de/2019_008>

* [1 Introduction and Motivation](http://www.zfdg.de/2019_008" \l "hd1)
  + [1.1 Emotions and Arts](http://www.zfdg.de/2019_008" \l "hd2)
* [2 Affect and Emotion](http://www.zfdg.de/2019_008" \l "hd3)
  + [2.1 Ekman’s Theory of Basic Emotions](http://www.zfdg.de/2019_008" \l "hd4)
  + [2.2 Plutchik’s Wheel of Emotions](http://www.zfdg.de/2019_008" \l "hd5)
  + [2.3 Russel’s Circumplex Model](http://www.zfdg.de/2019_008" \l "hd6)
* [3 Emotion Analysis in Non-computational Literary Studies](http://www.zfdg.de/2019_008" \l "hd7)
* [4 Emotion and Sentiment Analysis in Computational Literary Studies](http://www.zfdg.de/2019_008" \l "hd8)
  + [4.1 Emotion Classification](http://www.zfdg.de/2019_008" \l "hd9)
  + [4.1.1 Classification based on emotions](http://www.zfdg.de/2019_008" \l "hd10)
  + [4.1.2 Classification of happy ending vs. non-happy endings](http://www.zfdg.de/2019_008" \l "hd11)
  + [4.2 Genre and Story-type Classification](http://www.zfdg.de/2019_008" \l "hd12)
  + [4.2.1 Story-type clustering](http://www.zfdg.de/2019_008" \l "hd13)
  + [4.2.2 Genre classification](http://www.zfdg.de/2019_008" \l "hd14)
  + [4.3 Temporal Change of Sentiment](http://www.zfdg.de/2019_008" \l "hd15)
  + [4.3.1 Topography of emotions](http://www.zfdg.de/2019_008" \l "hd16)
  + [4.3.2 Tracking sentiment](http://www.zfdg.de/2019_008" \l "hd17)
  + [4.3.3 Sentiment recognition in historical texts](http://www.zfdg.de/2019_008" \l "hd18)
  + [4.4 Character Network Analysis and Relationship Extraction](http://www.zfdg.de/2019_008" \l "hd19)
  + [4.4.1 Sentiment dynamics between characters](http://www.zfdg.de/2019_008" \l "hd20)
  + [4.4.2 Character analysis and character relationships](http://www.zfdg.de/2019_008" \l "hd21)
  + [4.5 Other Types of Emotion Analysis](http://www.zfdg.de/2019_008" \l "hd22)
  + [4.5.1 Emotion flow analysis and visualization](http://www.zfdg.de/2019_008" \l "hd23)
  + [4.5.2 Miscellaneous](http://www.zfdg.de/2019_008" \l "hd24)
* [5 Discussion and Conclusion](http://www.zfdg.de/2019_008" \l "hd25)

<https://www.aclweb.org/anthology/P13-2085.pdf> (Character-To-Character)

Paper about Classification of Emotional Relationships in Novels  Frowning Frodo, Wincing Leia, and a Seriously Great Friendship: Learning to Classify Emotional Relationships of Fictional Characters. Output:= Graph <https://www.aclweb.org/anthology/N19-1067.pdf>

Video:= <https://vimeo.com/355760337>

Spotify possibilities

<https://developer.spotify.com/documentation/web-api/reference/tracks/get-audio-features/>

{ "duration\_ms": 255349,

"key: 5,

"mode": 0,

"time\_signature": 4,

"acousticness": 0.514,

"danceability": 0.735,

"energy": 0.578,

"instrumentalness": 0.0902,

"liveness": 0.159,

"loudness": -11.840,

"speechiness": 0.0461,

"valence": 0.624,

"tempo": 98.002,

"id": "06AKEBrKUckW0KREUWRnvT",

"uri": "spotify:track:06AKEBrKUckW0KREUWRnvT",

"track\_href": "https://api.spotify.com/v1/tracks/06AKEBrKUckW0KREUWRnvT",

"analysis\_url": "https://api.spotify.com/v1/audio-analysis/06AKEBrKUckW0KREUWRnvT",

"type": "audio\_features"

}

<https://developer.spotify.com/documentation/web-api/reference/tracks/get-audio-analysis/>

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"duration": 0.29765,

"confidence": 0.652

}

],

"beats": [

{

"start": 251.98282,

"duration": 0.29765,

"confidence": 0.652

}

],

"sections": [

{

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"duration": 18.32542,

"confidence": 1,

"loudness": -20.074,

"tempo": 98.253,

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"mode": 1,

"mode\_confidence": 0.566,

"time\_signature": 4,

"time\_signature\_confidence": 1

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"loudness\_max": -18.121,

"loudness\_end": -60,

"pitches": [

0.709,

0.092,

0.196,

0.084,

0.352,

0.134,

0.161,

1,

0.17,

0.161,

0.211,

0.15

],

"timbre": [

23.312,

-7.374,

-45.719,

294.874,

51.869,

-79.384,

-89.048,

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-4.676,

-51.303,

-33.274,

-19.037

]

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"confidence": 0.652

}

],

"track": {

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"sample\_md5": "",

"offset\_seconds": 0,

"window\_seconds": 0,

"analysis\_sample\_rate": 22050,

"analysis\_channels": 1,

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"tempo": 98.002,

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"mode": 0,

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"echoprintstring": "eJzlvQmSHDmStHslxw4cB-v9j\_A-tahhVKV0IH9...",

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"synchstring": "eJx1mIlx7ToORFNRCCK455\_YoE9Dtt-vmrKsK3EBsTY...",

"synch\_version": 1,

"rhythmstring": "eJyNXAmOLT2r28pZQuZh\_xv7g21Iqu\_3pCd160xV...",

"rhythm\_version": 1

}

}

High-Level Information from AcousticBrainz

[https://acousticbrainz.org/datasets/accuracy#danceability](https://acousticbrainz.org/datasets/accuracy" \l "danceability)

* danceability
* gender
* genre\_dortmund
* genre\_electronic
* genre\_rosamerica
* genre\_tzanetakis
* ismir04\_rhythm
* mood\_acoustic
* mood\_aggressive
* mood\_electronic
* mood\_happy
* mood\_party
* mood\_relaxed
* mood\_sad
* moods\_mirex
* timbre
* tonal\_atonal
* voice\_instrumental

Low-Level Information

[https://essentia.upf.edu/streaming\_extractor\_music.html#music-descriptors](https://essentia.upf.edu/streaming_extractor_music.html" \l "music-descriptors)

Metadata information available at <https://musicbrainz.org/doc/MusicBrainz_Database/Schema>

All MetaBrainz Datasets

<https://metabrainz.org/datasets>

**Zwischenbericht**

1. Was ist die Fragestellung und das Ziel des Projekts?
2. Was hat die Fragestellung mit Drama Mining und/oder Filmanalyse zu tun?
3. Welche Daten sollen werden verwendet?
4. Wie müssen die Daten ggf. aufbereitet werden und wie soll das technisch umgesetzt werden?
5. Wie sollen die Daten ausgewertet werden und wie soll das technisch umgesetzt werden?